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GOBIOID FISHES

OF THE FAMILIES

GOBIIDAE, PERIOPHTHALMIDAE, TRYPAUCHENIDAE,

TAENIOIDIDAE, AND KRAEMERIIDAE

OF THE

WESTERN INDIAN OCEAN

By

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Illustrations by Margaret M. Smith.

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Gobioid Fishes of the Families Gobiidae, Periophthalmidae, Trypauchenidae, Taenioididae and Kraemeriidae

OF THE WESTERN INDIAN OCEAN
(With Plates 9-13)

by J. L. B. SMITH,

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Rhodes University, Grahamstown.

The Gobioid fishes of the Western Indian Ocean are divided as follows :

- A. Dorsal in two distinct parts, the front of 6 spines, separate from or partly joined to 2nd fin :
 - I. Base of pectoral normal. Eyes normal :
 - a. Pelvics clearly separate **Eleotridae**
 - b. Pelvics at least partly united **Gobiidae**
 - II. Base of pectoral muscular. Eyes stalked. **Periophthalmidae**
- B. A single dorsal fin; no distinct spines in front :
 - I. A cavity above opercle **Trypauchenidae**
 - II. No cavity above opercle :
 - a. Pelvics united **Taenioididae**
 - b. Pelvics separate :
 - 1. Body naked. Anal less than 20 rays **Kraemeriidae**
 - 2. Scales present. Anal more than 20 rays **Gunnellichthidae**

The families Eleotridae (Bull. No. 11, 1958) and Gunnellichthidae (Bull. No. 9, 1958) have already been treated separately.

NOTE : Unless otherwise stated, types in this Department.

Scale series are counted from the gillopening to caudal base.

Transverse series are taken between anal origin and soft dorsal.

Family Gobiidae

Much said in the introduction to the Eleotridae (Bulletin No. 11 of this series, July 1958) applies with equal force to this large and closely related family, the overwhelming majority of whose members are small to minute fishes of shallow water, embracing some of the smallest vertebrates in existence. Most are found in coastal areas, some in freshwater, others have penetrated to fairly deep water.

Almost all Gobies are experts at concealment, spending most time by day in shelter of some kind, hidden either in sand, rubble, weed or crevices in rocks and coral. All are apparently carnivorous, and reproduction is by eggs. It has been discovered that in one genus (*Monishia*) mentioned below, buccal incubation is practised, and it is suspected in at least one other (*Stigmatogobius*).

Gobies abound in all parts of the W. Indian Ocean, and a large collection has been amassed in a series of expeditions covering most of the shores of this area except French possessions. Without poisons the efficient collecting of these fishes is extremely laborious, but the advent of preparations containing rotenone has wrought a dramatic change, for, by their aid, in a short time this hidden life is easily and completely brought to light. Even with this aid, in windswept East African coastal seas we found that to be certain of securing the smaller forms, it was essential to do the final collecting in shallow water prone, with goggles. In this way the amazing richness of the area in this type of life was revealed, and this is portrayed below.

Most Gobies are of dull or sombre hue, many are encased in mucus, but some are surprisingly colourful, even brilliant, as shown in Plates 10 and 11.

Because of their small size Gobiid fishes are not a favourite of most systematists. To casual glance most look much alike and it is only after intensive study that their bewildering variations in form and character become apparent. Those not especially interested are apt to be suspicious of the validity of the characters on which the inevitably numerous genera are based, but in the restricted life of these small fishes with highly specialised habits, characters which in others might seem of minor import, become elevated to major rank in differentiation. I wish here to pay tribute to the fine work in this group done by Dr. Albert W. Herre and Dr. F. P. Koumans, to whom all other investigators are greatly indebted.

The family Gobiidae as here accepted may be diagnosed as follows : Vertebrae 25-34. No airbladder. Gillmembranes variably attached to isthmus. 4 gills, the first slit sometimes closed by membrane, when rakers absent or poorly developed on outer arch. Pseudobranchiae usually present. Mouth more or less

terminal, protractile, dentition raptorial, rarely teeth on palate (only one in W. Indian Ocean). 2 separate dorsal fins, the 1st of mostly flexible spines. Pelvics united, sometimes weakly and basally only. Body typically scaly, rarely partly, sometimes naked.

While individual specialists differ in their views, the Gobiid fishes of the Indo-Pacific are currently divided among more than 100 genera. In the present work it has proved impossible to assign all forms clearly to existing genera, and it has been found desirable to erect others. As a result the Gobiid fishes of the W. Indian Ocean are placed in 48 genera, of which 11 are presented as new.

There has hitherto been no comprehensive survey of the Gobiidae of the W. Indian Ocean, and the present investigation has shown that close on 150 species of Gobiid fishes have been recorded from there, some clearly invalid or malidentified with known species from the Atlantic. Because of the large numbers of species, only those which occur from Delagoa Bay northwards have been treated here. Revision has drastically reduced the number recorded from this part of the W. Indian Ocean, and in the present work are shown 103 species considered valid, of which 34 are described as new, some most interesting forms, also 10 species previously known from the Pacific only have been discovered and are now recorded. In addition 10 species of doubtful validity, and 6 purely freshwater species are listed below. Every new species and new record has been illustrated and as many known species as possible. The more colourful types are shown on Plates 10 and 11. In the case of 11 species of which specimens were not available, reliable figures from other works have been copied, and 89 species in all have been illustrated. The Gobiid fishes appear to fall naturally into the following subfamilies:

- A. Body more or less elongate, subcylindrical:
 - I. 1st dorsal partly joined to 2nd. No scales **Croilinae**
 - II. 1st dorsal separate from 2nd. Scales present:
 - a. Teeth in lower jaw in several rows.
Pelvic fraenum rarely with fleshy processes **Gobiinae**
 - b. Teeth in lower jaw usually in one row.
Pelvic fraenum usually with fleshy processes **Sicydiaphiinae**
- B. Body more or less oval, rather deep, compressed **Gobiodontinae**

Sub-family Croilinae

1. **Croilia** Smith, 1955.

Genotype **C. mossambica** Smith, 1955. Head and body little compressed. No scales. Teeth in bands, outer little larger, no canines. Palate edentate. Tongue bilobed. Gillopening wide, well forward. No spine in 2nd dorsal or anal. Pelvic fraenum marked. Caudal exceeds head. Otoliths notably large. Only the type.

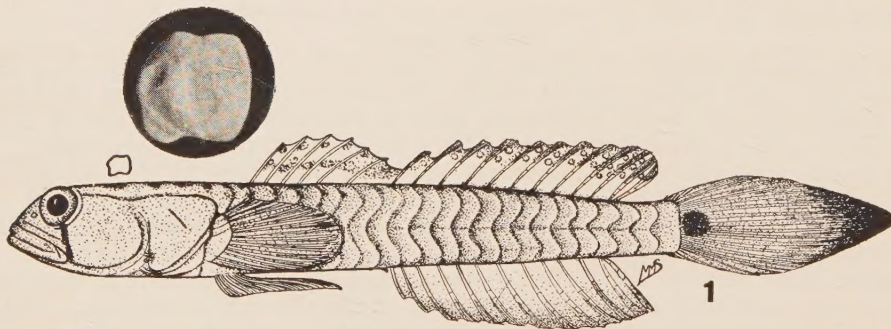


Fig. 1. **Croilia mossambica** Smith. Type, 55 mm. Inset, otolith.

CROILIA MOSSAMBICA Smith, 1955. Smith 1955, 106, f 1. D VI 11-12. A 12. P 15. 4+1+9 gillrakers. 4 specimens, 55-60 mm., from bottom burrows in one fathom, Polela Lake, Inharrime (25°S).

Sub-family Gobiinae.

KEYS TO GENERA

- | | |
|---|---------------------------|
| { A. No scales | 1. Croilia } |
| { AA. Scales present | B } |
| B. Teeth on vomer | 2. Smilogobius |
| BB. Palate edentate | C |
| C. 1-3 spines on preopercle | Group C |
| CC. No spines on preopercle | D |
| D. Front spine in each dorsal bony | 5. Oplopomops nov. |
| DD. Front spine in each dorsal normal | E |
| E. Fleshy flaps on edge of shoulder | Group E |
| EE. No fleshy flaps on edge of shoulder | F |

F.	Caudal longer than head	Group F
FF.	Caudal not longer than head	G
G.	Teeth in upper jaw in 2 rows	Group G
GG.	Teeth in upper jaw in more than 2 rows	H
H.	Pelvic fraenum weak or absent	Group H
HH.	Pelvic fraenum well developed	I
I.	Gillopening restricted	Group I
II.	Gillopening well forward below	J
J.	Tongue rounded	Group J
JJ.	Tongue truncate or bilobed	Group K

Genera — Group C

Preopercle spinate :		
A.	Spines on preopercle short	3. Oplopomus
B.	Spine on preopercle reaches pectoral	4. Gladiogobius

Group E

Preopercle smooth. Fleshy processes on edge of shoulder below opercle :		
A.	Caudal longer than head	6. Stenogobius
B.	Caudal not longer than head :	
	I. Opercle naked	7. Platygobius
	II. Opercle scaly	8. Chonophorus

Group F

Group 1

No shoulder processes. Caudal longer than head :

A. Gilloping wide :

I. Less than 30 scales 9. **Obliquogobius**

II. 50-65 scales :

a. Caudal rounded, symmetrical 10. **Ctenogobiops nov.**

b. Caudal pointed, asymmetrical 11. **Vanderhorstia**

III. 80-130 scales :

a. D & A with less than 15 soft rays 12. **Cryptocentrus**

b. D & A with more than 15 soft rays 13. **Biat**

B. Gilloping to preopercle margin :

I. Body scaly to shoulder 14. **Obtortiofagus**

II. Scaling incomplete, none on shoulder 15. **Iotogobius nov.**

C. Gilloping barely exceeds P. base :

I. Less than 50 scales :

a. Mid line of predorsal naked 16. **Ctenogobius**

b. Some mid-predorsal scales :

1. Barbels on chin 17. **Parachaeturichthys**

2. No barbels on chin :

x. Interorbital more than $\frac{1}{2}$ eye 18. **Stigmatogobius**

y. Eyes adjacent 19. **Acentrogobius**

II. 50 or more scales :

a. One row of teeth in upper jaw 20. **Oxyurichthys**

b. 2 or more rows of teeth in upper jaw :

1. 50-80 scales 21. **Amblygobius**

2. 125-130 scales 23. **Flabelligobius**

Group G

Caudal not longer than head. 2 rows of teeth in upper jaw.		
A.	20-25 scales. Minute	24. Pandaka
B.	50-80 scales. Larger :	
I.	Scales on opercle	21. Amblygobius
II.	Head quite naked	22. Seychellea

Group H

More than 2 rows of teeth in upper jaw. Pelvic fraenum weak or absent.	
A. All scales cycloid, front half of body naked	25. Feia nov.
B. Most scales ctenoid, cover body :	
I. No predorsal scales :	
a. P with silklike rays	26. Monishia nov.
b. No silklike rays in P :	
1. Gillopening restricted	27. Cabillus nov.
2. Gillopening wide	30. Zonogobius
II. Predorsal scales present :	

- a. Gilloping restricted :
 - 1. Median part of nape naked 28. **Fusigobius**
 - 2. Median part of nape scaly 29. **Palutrus nov.**
- b. Gilloping wide — nape scaly to eyes 31. **Quisquilius**

Group I

Pelvic fraenum developed. Gilloping little more than pectoral base.

- A. Mid predorsal naked. Tongue rounded 32. **Coryphopterus**
- B. Mid predorsal naked. Tongue truncate or bilobed 16. **Ctenogobius**
- C. A few minute scales on broad depressed nape 33. **Abranches**
- D. Normal scales mid predorsal :
 - I. More than 50 scales 21. **Amblygobius**
 - II. Not more than 50 scales :
 - a. Skinny papillate flaps on head 34. **Drombus**
 - b. No marked flaps on head :
 - 1. Foremost scale on nape enlarged 18. **Stigmatogobius**
 - 2. Foremost scale on nape not enlarged :
 - x. Tongue bilobed. P with silklike rays 35. **Bathygobius**
 - y. Tongue not bilobed. Rarely silklike rays in P 19. **Acentrogobius**

Group J

Gilloping more than pectoral base. Tongue rounded.

- A. Less than 60 scales :
 - I. Maxilla well behind eye 36. **Waitea**
 - II. Maxilla not behind eye 37. **Gnatholepis**
- B. 60-75 scales :
 - I. Scales predorsal 14. **Obtortioophagus**
 - II. Nape quite naked 38. **Cryptocentroides**
- C. More than 80 scales 12. **Cryptocentrus**

Group K

Gilloping more than pectoral base. Tongue truncate or bilobed.

- A. Less than 50 scales :
 - I. Head depressed :
 - x. Tongue truncate, mid predorsal naked 39. **Silhouettea nov.**
 - y. Tongue bilobed, mid predorsal scaly 40. **Glossogobius**
 - II. Head not depressed 37. **Gnatholepis**
- B. 50-60 scales, none on nape 10. **Ctenogobiops nov.**
- C. More than 80 scales 12. **Cryptocentrus**

2. **Smilogobius** Herre, 1934.

Genotype **S. inexplicatus** Herre, 1934. Head and body compressed. Minute cycloid scales, sometimes on side of nape, midnape and head naked. Teeth in bands, outer larger, canines, 2 large incisors on vomer. Gilloping extends little forward. Pelvic fraenum strong. Caudal equals head. **SMILOGOBIUS SINGAPURENSIS** Herre, 1936. (PI 13, J). Roux-Esteve & Fourmanoir 1955, 201. Roux-Esteve 1956, 100 (Rec.Red Sea). D VI+I 10. A I 9-10. 75-85 scales. Tr 30. Previously known only from 2 specimens from Singapore, this record from Red Sea of interest.

3. **Oplopomus** Valenciennes, 1837.

Genotype **Gobius oplopomus** Val, 1837. Head and body compressed. 24-30 ctenoid scales, nape scaly, sometimes opercle. 1-3 flat spines on preopercle. Teeth in bands, outer larger, canines. Palate edentate. Tongue truncate. Gilloping exceeds pectoral base. 1st spine in each dorsal strong, bony. Pelvic fraenum strong. Caudal less than head. 2 species.

- A. Opercles naked **oplopomus**
- B. Scales on opercles **caninoides**

OPLOPOMUS OPLOPOMUS (Val), 1837. (PI 11, B). **Gobius oplopomus** Klunzinger 1870, 471. Gunther 1877, 170, Pl 90, f B. Steindachner 1898, 786 (All Red Sea). **Gobius bitelatus** Klunzinger 1870, 476 (Red Sea). Angot 1950, 460 (Mad.). **Gobius pulcher** Hemprich & Ehrenberg 1899, Pl 9, f 6 (Red Sea). D VI+I 10. A I 10. P 1+16+1. Scales 28-29. Tr 9-10. Predorsal about 10. Gillrakers 1+1+5. Depth 4; head 3.7 in length. Eye 4 in head, equals snout, $\frac{1}{4}$ diameter apart. A band of papillae below eye and across cheek, several lines on opercle. Nostrils equally spaced on snout, anterior a low tube, hinder a pore. 2 broad flat spines on preopercle margin. Gilloping to below preopercle margin, rakers moderate, fleshy. Mouth small, little oblique, lower jaw projects slightly, maxilla to below hind nostril. A narrow band of fine teeth in each jaw, in lower, outer and inner series in front larger, on side a recurved canine. In upper jaw outer series of teeth larger, inner also, depressible. Tongue truncate, with median point. 1st spine in each dorsal bony, stout, that in 2nd fin usually longer than 1st, 4th and 5th spines longest, $\frac{3}{4}$ body depth. Soft rays increase little

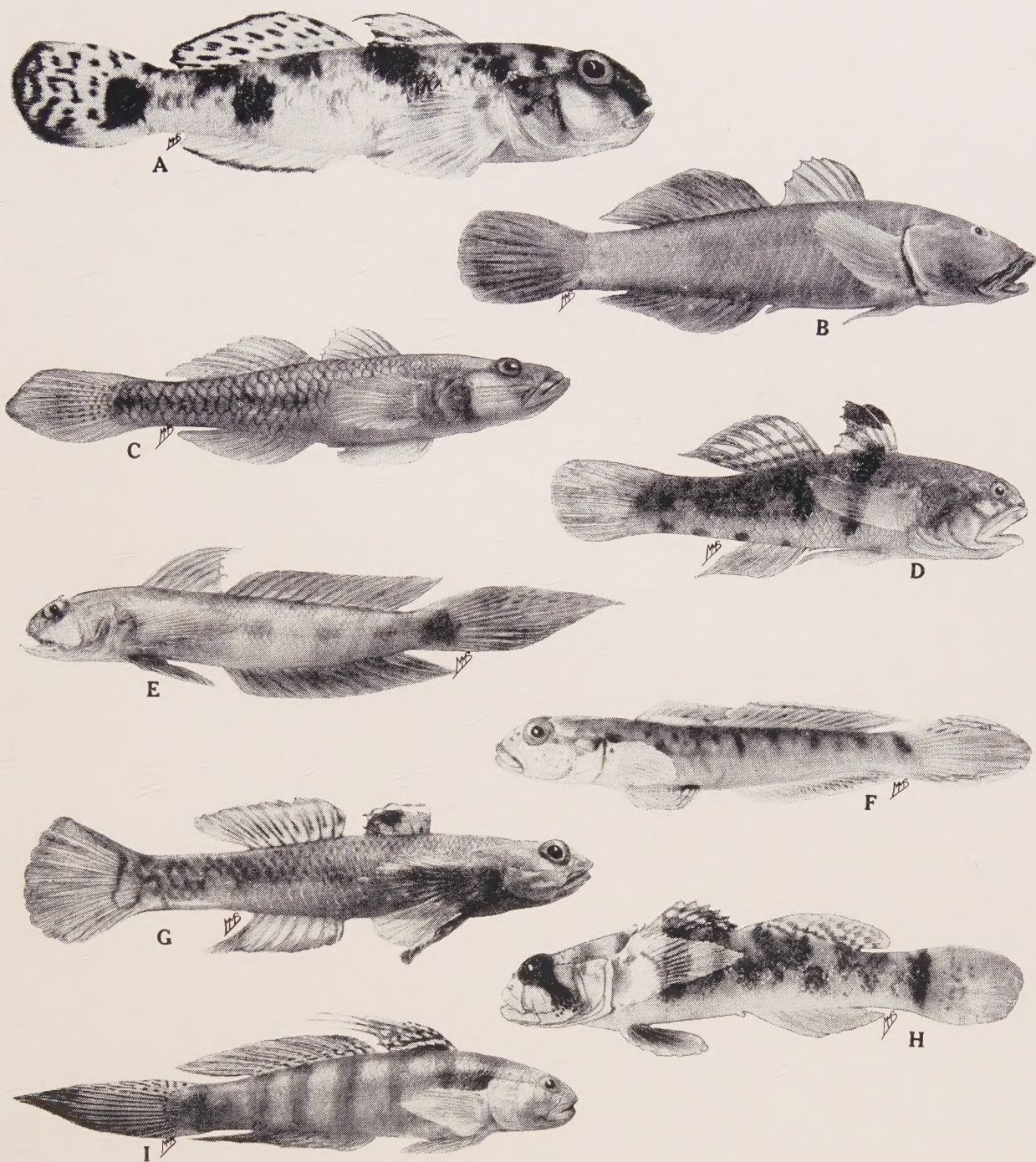
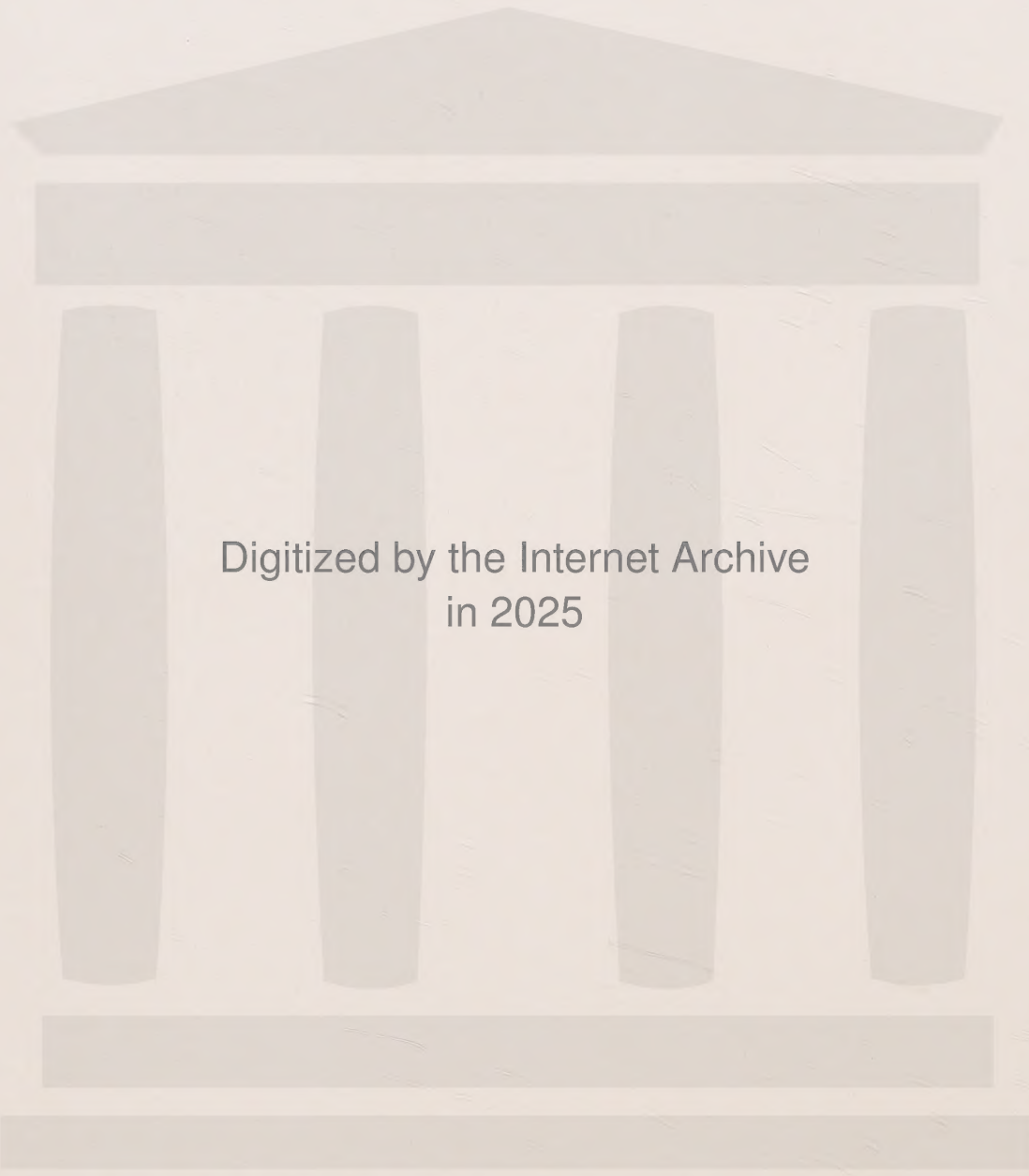


PLATE 9.

- | | |
|--|---|
| A. <i>Ctenogobius nebulosus</i> (Forsk.). 130 mm. | F. <i>Cryptocentrus fasciiventris</i> n. sp. Type, 90 mm., Fem. |
| B. <i>Platygobius aeneofuscus</i> (Peters). 200 mm. | G. <i>Stigmatogobius inhacae</i> n. sp. Type, 35 mm. |
| C. <i>Glossogobius giurus</i> (Ham Buch). 105 mm. | H. <i>Monishia oculata</i> n. sp. Type, 25 mm. |
| D. <i>Acentrogobius balteatops</i> n. sp. Type, male, 38 mm. | I. <i>Stenogobius kenya</i> n. sp. Type, 105 mm. Male. |
| E. <i>Oxyurichthys tentacularis</i> (Val.). 98 mm. | |



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posteriorly, end of fin rounded, short of caudal base. Anal rays increase rearwards, last longest, little longer than last dorsal ray, $\frac{3}{4}$ body depth, end of fin acute, short of caudal. Pectoral less than pelvic, 1.1 in head, barely to vent. Caudal rounded, 1.3 in head. Scales ctenoid, but on belly, chest and pectoral base, cycloid. Head naked, scales on nape end near preopercle margin, median scales small, obsolete in front, where naked area. Live colour as in Pl 11, B. Preserved; whitish, with dark marks as shown in Pl 11; dark spot $\frac{1}{2}$ eye on shoulder above opercle and one at caudal base most prominent. 6 specimens, 62-75 mm. length, from Inhaca, Pinda and Nacala (Moz.); Mahé (Seych.). Recorded from a wide area of the tropical Indo-Pacific, Red Sea, India and Ceylon, rather rare.

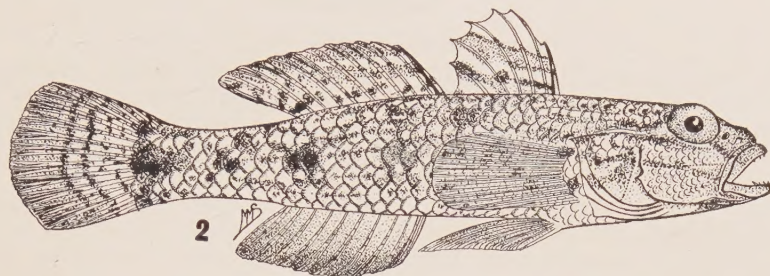


Fig. 2. *Oplopomus caninoides* (Blkr), 52 mm.

OPLOPOMUS CANINOIDES (Bleeker), 1852. Norman 1939, 72. Koumans 1953, 31. (*vergens* Jordan & Seale, 1906-7). D VI+I 10. A I 10. P 19. Scales 30. Tr 9. Predorsal 10. Gillrakers 2+1+7. Depth 4.6; head 3.4 in length. Eye 3.3 in head, equals snout. Eyes adjacent, reach dorsal profile. A broad band of papillae below eye, a series across cheek, one down and one across opercle. A flat spine on preopercle margin. Front nostril a low tube, hinder a pore close before eye. Gilloopening forward, not to preopercle, rakers fleshy. Mouth small, oblique, lower jaw projects little, maxilla to below hind nostril. In lower jaw narrow band of fine teeth, outer and inner series enlarged, on side of jaw a recurved canine. In upper jaw a wider band of fine teeth, outer and inner series somewhat enlarged. Tongue subtruncate, slight point. The bony spines in dorsal subequal, 2nd-4th spines longest, about $\frac{3}{4}$ body depth. Soft rays increase little behind, end of fin rounded, far short of caudal, anal same shape and size. Pectoral equals pelvic, 1.2 in head, former to anal origin, pelvic to slightly beyond. Caudal little rounded, 1.2 in head. Scales mostly ctenoid, predorsal to eyes. Before pelvic, on pectoral base, 2 series on upper part of opercle, 6-7 series on cheek, all cycloid. Live colour unknown; as preserved, brownish yellow, with dark marks as shown in fig. 2. Pelvics dusky. One only, 52 mm. length, Nacala (Moz.), rare, previously known from central tropical Indo-Pacific, also Gulf of Aden and Persian Gulf.

4. *Gladiogobius* Herre, 1933.

Genotype *G. ensifer* Herre, 1933. Differs from all other genera in long spine on preopercle, other generic characters in description below.

GLADIOGOBIUS ENSIFER Herre, 1933 (Pl 11, J). Herre 1933, 23. Koumans 1953, 32, f 6. D VI+I 10. A I 9. P 1, 15, 1. Scales 26-27. Tr 8. Gillrakers 3+1+8. Depth 4.0; head 3.6; pectoral 3.3; pelvic 3.6; caudal 4 (2.3 with filament) in body. Eye 4 in head, 1.2 times snout. Head and body compressed, eyes adjacent, erectile. Front nostril $\frac{1}{4}$ eye length tube over lip, hinder a pore before eye. Many series of papillae on cheek and head. A low crest median along nape almost to eye, flanked by line of papillae. Gilloopening to below midopercle, rakers well developed, on lower limb subequal. Spine on preopercle up to half head length, reaches over pectoral base. Mouth moderate, oblique, maxilla below front or mid eye, teeth in bands, outer larger, no canines. Palate edentate. Tongue rounded. 4th dorsal spine elongate, up to little more than head, soft rays longer behind, 8th dorsal and anal rays to beyond caudal base, anal little lower than dorsal. Pectoral to 3rd anal ray. Pelvics to anus, united basally, no fraenum. Caudal little rounded, lower mid ray elongate, without this equals head. Ctenoid scales, cycloid below front of 1st dorsal, none before hind opercle, cycloid on belly, prepelvic and pectoral base, nape and head naked. Live colour as Pl 11, J; preserved; light with odd dark marks as in Pl 11. 4 specimens, 35-47 mm., from Ibo, Aldabra and Mahé (Seych.), Ibo specimen shows faint dark lines along whole body. Rare, previously known only from East Indies and Philippines, these records are of interest.

5. *Oplopomops* nov.

Genotype *Oplopomus diacanthus* Schultz, 1943 = *atherinoides* Peters, 1855. Differs from all other genera in having 1st spine in both dorsals strong and bony, but no spines on preopercle, otherwise exactly like *Oplopomus* Val., 1837.

OPLOPOMOPS ATHERINOIDES (Peters), 1855. *Gobius atherinoides* Peters 1855, 445 (Moz.). Jatzow & Lenz 1898, 506 (Zanz.). *Oplopomus diacanthus* Schultz 1943, 242, f 21 (Canton Is., Pac.). D VI+I 10. A I 9-11. P 1+15-16+1. Scales 27-28. Tr 8. Predorsal 8. Gillrakers 2+1+6. Depth 5.5; head 3.8 in length. Eye 3 in head, 1.2 times snout. Eyes adjacent. Several series of papillae along cheek, one vertical and some oblique on opercle. No spine on preopercle. Nostrils equally spaced on snout, anterior a small tube, hinder a pore

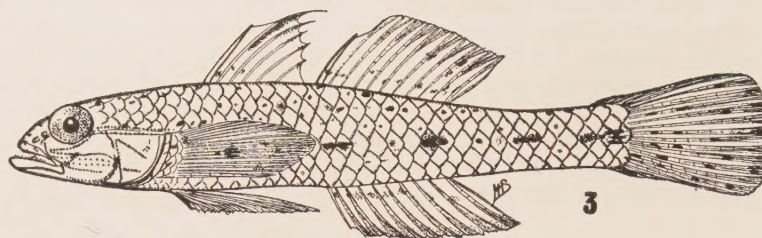


Fig. 3. *Oplopomops atherinoides* (Peters), 43 mm.

with low front rim. Gilloopening little below, not to preopercle, rakers fleshy. Mouth small, little oblique, lower jaw projects, maxilla to front of pupil. In lower jaw a series of small recurved teeth in front, ending in recurved canine, behind is narrow band of fine teeth, inner series larger, depressible. In upper jaw a band of fine teeth, outer series larger, also inner, depressible. Tongue truncate. Each dorsal with a bony 1st spine, that of 1st fin longer, 2nd dorsal spine longest, little less to little more than body depth, soft rays subequal, end of fin acute, far short of caudal. Anal similar. Pectoral and pelvic equal head, to or near anal origin. Caudal subtruncate, equals or exceeds head. Scales ctenoid, predorsal to eyes; but cycloid close behind pelvic, prepelvic, and on pectoral base. Head naked. Live colour: yellowish, with odd orange marks and specklings; preserved; dark marks as shown in Fig 3 above. 4 specimens, 35-45 mm. length, from Mahé (Seych.), low tide in sandy coral pools. Previously recorded from Mozambique and Canton Is., Pacific. Schultz's 1943 figure shows ctenoid scales before pectoral and on chest, also rounded caudal, in which my specimens differ, but are otherwise identical, despite great distance between localities. Little doubt that all fall with *atherinoides* Peters.

6. *Stenogobius* Bleeker, 1874.

Genotype *Gobius gymnopomus* Blkr., 1853. Compressed head and body. 45-55 ctenoid scales, nape scaly, sometimes opercles. Teeth in bands, outer larger. Palate edentate. Tongue truncate. Gilloopening little exceeds pectoral base. Skinny flaps on edge of shoulder. D2 and A I 10-12. Pelvic fraenum strong. Caudal exceeds head in males.

A. Midline of nape naked *gymnopomus*

B. Nape wholly scaly:

I. Cheek and opercle scaly. 16-20 scales predorsal *genivittatus*

II. Cheek and mostly opercle naked. 12-14 scales predorsal *kenyae*

STENOBOBIUS GYMNOPIOMUS (Blkr.), 1853. *Gobius gymnopomus* Tortonese 1941, 3 (It. Somaliland). Koumans 1953, 34. D VI+I 10. A I 10. Scales 50. Tr. 11. Predorsal on side 18, midline of nape and breast naked. In males 2-4 D spines exceed depth. Red-green above, yellow below, spotted, on side 3 cross bars, curve back. Streaks on side of head, violet bar from eye to behind maxilla. 1st dorsal basally violet with yellow line, distally red with yellow spots, 2nd D, A and caudal violet spotted, margin yellow, pectoral yellow, dark spot above, pelvic violet. To 135 mm. (Koumans). India and East Indies, recorded from Italian Somaliland. Not seen.

STENOBOBIUS GENIVITTATUS (Val.), 1837. *Gobius polyzona* Bleeker & Pollen 1875, 55, Pl 17, f 1. Sauvage 1875, 370, Pl 40, f 3 (Madag.). Koumans 1953, 35, f 7. Not seen. D VI+I 10-11. A I 10-11. P 15-16. Scales 50-55. Tr 12-14. Predorsal 16-20. Nape fully scaly, scales on opercle and cheek. Pectoral equals head, pelvic and caudal exceed head. 2-4th D spines elongate. In life yellow, with 8-12 narrow cross bars, vertical fins pinkish, 1st D with dark bars, margin of anal dusky, pelvic dusky, pectoral yellow. A bar eye to corner of mouth. Attains 165 mm. Widespread in East Indies, Japan, Philippines, recorded from Madagascar. Bleeker & Pollen (1875 above) state 12 predorsal scales and show the head naked, pectoral base scaly.

Stenogobius kenyae n. sp. (Pl 9, I)

D VI+I 10. A I 10(11). P 16. Scales 46-50. Tr 11-12. Predorsal 12-14. Depth 4.4-2; head 4.3-4.4 in body. Caudal, males 2.2-2.4, females 2.6-3 in body. Eye 4 in head, equals snout; 1.2 times interorbital. 5 vertical series of papillae below eye, 1-2 along cheek. Front nostril small tube in front, pair close together on snout, hinder a larger pore before eyes. Gilloopening restricted, on shoulder, 2-4 small processes, rakers obsolete. Maxilla to below front of eye to mid pupil, teeth in 4-5 series in each jaw, outer little enlarged. Tongue weakly emarginate. In males 2nd-4th dorsal spines elongate, 3rd longest, up to 1.6 times depth. Soft rays increase behind, equal body depth, end of fin to caudal base, anal similar. Pectoral 1.1 in head, not to vent. Pelvic 1.1-1.2 in head, barely to vent, fraenum strong. Scales ctenoid behind, become cycloid on nape and belly, pectoral base naked, prepelvic area mostly naked, sometimes a few minute embedded scales. Nape fully scaly to eyes, head mostly naked, one specimen has 3 small scales on upper part of opercle. As preserved: yellowish, darker markings as in Pl 9, anal and pelvic with dark margin. 5 females, 66-100 mm., and 2 males, 105, 120 mm., all from Sabaki River, Kenya, the type a male, 105 mm. Closely related to and possibly identical with *genivittatus* Val., but my specimens differ from descriptions in having cheek always naked, fewer predorsal scales, breast mostly naked and pelvic never more than head. Bleeker & Pollen 1875, 55 describe *Gobius polyzona* from Madagascar as having 12 predorsal scales. This species is usually placed in *genivittatus* Val., but may prove rather identical with *kenyae*.

7. *Platygobius* Bleeker, 1874.

Genotype ***Gobius macrorhynchus*** Blkr., 1867. Head and front of body depressed, small eyes, wide apart. Small ctenoid scales, cover nape, not to eyes, head naked. Mouth large, teeth in narrow bands, outer little enlarged. Palate edentate. Tongue adnate. Gillopening little forward below, 2-3 small flaps on shoulder edge. Pelvic fraenum strong. Caudal less than head.

PLATYGOBIUS AENEOFUSCUS (Peters), 1852 (PI 9, B). ***Gobius aeneofuscus*** Peters 1852, 681: and 1868, 18, Pl 3, f 1 (Moz.). Gunther 1861, 61 (Moz.). Steindachner 1881, 242 (Mad.). Norman 1922, 322 (Natal). Pellegrin 1933, 138 f 77 (Mad.). Smith 1949b, 335, Pl 70, f 925. ***Gobius banana*** (non Val.) Sauvage 1875, 376, Pl 38, f 1 (Mad.). D VI(VII)+I 10-11. A I 10-11. P 16-17. 58-65 scales. Tr 18-24. Predorsal 24-28. Gillrakers 1+1+4-5. Depth 4.3-5, head 3.3-3.5 in body. Eye 5-7 in head, 2-3 in snout, 1.2-2.1 in interorbital. Head broad, convex. Nostrils midway on snout, close together, anterior a small tube, hinder a pore. Gillopening to below preopercle margin, rakers feeble, 2-4 knobs on edge of shoulder. Maxilla near front of eye, beyond with age, lower jaw variably equal or shorter. Teeth in young in 3 series above, 4-5 with age, outer larger, in 4-6 series in lower jaw. Tongue bilobed, fully adnate. Dorsals low, anal similar. Pectoral 1.3 in head, short of anus. Pelvic cupshaped, 1.6-2 in head, far short of anus. Caudal 1.1-1.2 in head. Scales ctenoid in young, remain so to nape, with age less marked, cycloid in front, predorsal scales $\frac{3}{4}$ to eyes. Small cycloid scales on pectoral base and on hind half of prepelvic. Head naked. In life variably greenish to dusky with blotches on flanks, several dark lines from eye to mouth. Dorsal, caudal and pelvic greenish, pectoral and anal yellow. Preserved, uniform. Said to reach 250 mm. Rivers and estuaries of South and E. Africa. Changes with age, the head broadens, maxilla enlarges and there are more scales. It seems likely that several freshwater species of this type from Madagascar all fall here.

8. *Chonophorus* Poey, 1860.

Genotype ***C. bucculentus*** Poey, 1860 = ***banana*** Val., 1837. Head and body little compressed. Small ctenoid scales, on nape, sometimes on opercle. Eyes small, wide apart. Teeth in bands, outer enlarged. Palate edentate. Tongue bilobed. Gillopening little exceeds pectoral base. Fleshy flaps on edge of shoulder. D2 I 9-11. A I 10. Pelvic fraenum strong. Caudal less than head. 2 species recorded, not seen, possibly identical.

- A. 50-52 scales; predorsal 13-15 **melanocephalus**
B. 52-58 scales; predorsal 17-24 **stamineus**

CHONOPHORUS MELANOCEPHALUS (Blkr.), 1849 (PI 13, B). ***Gobius melanocephalus*** Bleeker 1849, 33. (***personatus*** Blkr., 1849: ***grammepomus*** Blkr., 1849: ***stoliczae*** Day, 1870). Not seen. D VI+I 10. A I 10. P 15-17. Scales 50-52. Tr 13-15. Predorsal 13-15. Eye 4-5 in head, 1-2 times interorbital. Marked as shown, in life greenish. Attains 150 mm. Rivers and estuaries of wide area of central tropical Indo-Pacific, recorded from Madagascar & Mauritius. Natal records (Barnard 1927, 818) are based on malidentification.

CHONOPHORUS STAMINEUS (Val.), 1842. ***Gobius grammepomus*** (non Blkr.) Peters 1876, 441; Mobius 1883, 53 (Maur.). Compiled: D VI+I 10. A I 10. P 16-18. 52-58 scales. Tr 16-19. Predorsal 17-24. Eye 4-5 in head, 1-1.5 times interorbital. Greenish, head and body with black spots. 2 dark streaks from eye to maxilla. Dorsal with dark lines, a black spot on mid caudal base, and one on upper P base. Attains 170 mm. Known from rivers and estuaries over wide area of W. Pacific and India, Mauritius records doubtful.

9. *Obliquogobius* Koumans, 1941.

Genotype ***Gobius cometes*** Alcock, 1890. Head and body compressed, eyes close together. Large scales, ctenoid behind, cycloid in front. Midline of nape naked, sides scaled, scales on preopercle, rest of head naked. Several rows of barbels on side of head. Teeth in bands, no canines. Tongue emarginate. Gillopening wide. Pelvics united. Caudal asymmetric, exceeds head. Only the type species.

OBLIQUOGOBIUS COMETES (Alcock), 1890 (PI 13, I). ***Gobius cometes*** Alcock 1890, 208, Pl 7, f 2 (Madras). Norman 1939, 72 (Aden). Not seen. D VI+I 9-10. A I 9-10. P 23. Scales 23. Tr 7. About 7 predorsal on side. Head 2.7, depth 4, caudal 2.2 in body. Eye 3.7 in head. 6 cycloid scales round preopercle margin, opercle naked. Soft D & A pointed behind, to beyond caudal base. In life grey, with 7 wide yellow cross bars that fade. Preserved, as shown. 100-130 mm., from about 100 fathoms, Madras & Aden.

10. *Ctenogobiops* nov.

Genotype ***C. croceineus* n. sp.** Head and body compressed, eyes adjacent. 55-60 ctenoid scales, cycloid and small in front, head, nape and pectoral base naked. Teeth in bands, outer and inner enlarged, canines. Palate edentate. Tongue little notched. Gillopening forward to below eye. Pelvic fraenum strong. Caudal less or more than head. Closely related to ***Ctenogobius*** Gill, differs in more slender body and wide gillopenings. ***Aparrius aurocingulus*** Herre, 1935 from Fiji probably falls here.

***Ctenogobiops croceineus* n. sp. (PI 11, K)**

D VI+I 11-12. A I 11. P 2, 15, 2. Scales 55-60. Tr 14-15. Gillrakers 3-4+1+10-11. Depth 4.8-5.2; head 3.3; pectoral 3.6; pelvic 4; caudal 3.5-4 in body. Eye 4.5 in head, equals snout. Eyes clearly erectile. A series of papillae along cheek low down, few visible on head. Nostrils equally spaced on snout, anterior a low tube, hinder a pore. Gillopening wide, to below hind margin eye, upper rakers feeble, 2nd on lower limb longest, about $\frac{1}{3}$ eye, shorten little in front. Mouth moderate, slightly oblique, lower jaw projects

little, maxilla to about hind margin eye. Lower jaw with moderate band of fine teeth, in front on each side 8 slightly larger teeth, on side of jaw within band 3-4 recurved unequal canines. In upper jaw 2 canines on each side in front, outer large, on side of jaw outside a row of large teeth, and in front, behind band, on each side, 3 larger depressible teeth. Tongue truncate or notched. 2nd dorsal spine longest, up to body depth, 2 fins separate, soft rays increase hindwards, 2nd last longest, equals body depth. Anal similar. Pectoral little less than head, to about 3rd anal ray. Pelvic 1.2 in head, to anal origin. Caudal 1.1 in head, rounded. Scales ctenoid, largest on peduncle, smaller forwards, irregular below 1st dorsal, end above gill-opening. From before 2nd dorsal origin and on belly most are cycloid, none on chest, pectoral base, nape or head. Live colour: as shown in Pl 11, K: preserved, yellowish, with dark marks as shown in Pl 11; a bar round front of and several dark spots on chin; pelvics dusky. 3 specimens, 43, 48 and 50 mm. from Mahé (Seych.), the last, the type. Taken by poison in sand below low tide mark, a handsome fish. Closely related to **Aparrius aurocingulus** Herre, 1935, from Fiji, this known from 4 specimens, 36-45 mm. Mine differ from Herre's 1935 description in lacking ventral cross bars, caudal shorter than head and not more than 15 transverse series of scales. Herre's illustration (Herre 1936, f 27) is suspect, as it shows 1st dorsal spine elongated whereas text states 2nd. Herre states caudal 2.5 in body length, much exceeding head, in my specimens it is unbroken and shorter than head. Provisionally we maintain the W. Indian form as distinct.

11. *Vanderhorstia* Smith, 1949.

Genotype **Gobius delagoae** Brnrd., 1937. Head and body moderately compressed. 55-65 ctenoid scales, cycloid in front, nape and head naked. Teeth in bands, outer enlarged, canines. Palate edentate. Tongue truncate. Gillopening wide. Pelvic fraenum strong. Caudal pointed, asymmetrical, exceeds head.

A. 5th dorsal spine longest. 55 scales **delagoae**
 B. 2-4th dorsal spines longest. 65 scales **ornatissima**

VANDERHORSTIA DELAGOA (Brnrd.), 1937. **Gobius delagoae** Barnard, 1937. Smith 1949b, 336, f 930, Pl 55, f 930. D VI+I 13. A I 13. P 20. Scales 55. Tr 14. Gillrakers 5-6+1+9-10. 5th D spine longest. Live colour green, body and fins barred with red, orange, yellow and blue, as shown Smith 1949b. To 75 mm., found only at Inhaca and Bazaruto.

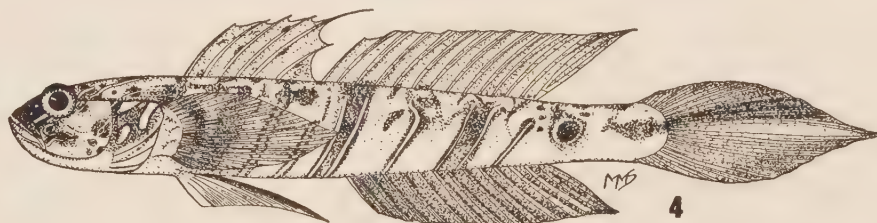


Fig. 4. *Vanderhorstia delagoae* (Brnrd). Type, 70 mm.

Vanderhorstia ornatissima n. sp. (Pl 10, C).

D VI+I 13. A I 13. P 20. Scales 65. Tr 13. Gillrakers 2-3+1+8. Depth 6.5; head 4; pectoral 3.3; pelvic 4; caudal 2.8 in body. Eye 4.4 in head, equals snout. Head and body subcylindrical, moderately compressed. Eyes dorsal, adjacent, in front of head. Papillae ridges undulate below eye. Front nostril a low tube over lip, hinder a pore close before eye. Gillopening wide, far forward, isthmus narrow, rakers short, longest before angle, diminish in front, upper feeble. Opercular flap covers half pectoral base. Mouth small, oblique, maxilla to below about middle eye, lower jaw projects. In each jaw bands of fine teeth, in upper 4 caniniform, recurved on each side in front, in lower, outer series in front slightly larger, 1-2 recurved canines on side. Tongue truncate. 3rd dorsal spine filamentous, up to more than $\frac{1}{2}$ standard length, also 2nd and 4th sometimes, but shorter than 3rd, soft fin lower, rays increase to 11-12th, 1.3 times body depth. Anal rays shorter, 11th little exceeds body depth. Pectoral 1.2 times head, pelvic with large fraenum, 1.1 times head, both to anal origin. Caudal pointed, 1.4-1.6 times head, 4-7th divided rays from above extended. Scales small, largest on peduncle, smaller forwards, ctenoid to front $\frac{1}{4}$ of 2nd dorsal, in front cycloid. Belly and chest scaly, nape and head naked. Live colour: Brilliant, as shown in Pl 10, C; others paler. Preserved; yellowish, with darker pattern as faded from live colours. 8 specimens, 42-57 mm., 7 from Pinda and one from Mahé (Seych.), the type, 57 mm., Pinda. Closely related to **delagoae** Brnrd., 1937 but differs in more scales, while the dorsal fin is different, the 5th spine in **delagoae** is longest.

12. *Cryptocentrus* Valenciennes, 1837.

Genotype **Gobius cryptocentrus** Val., 1837. Elongate compressed body and head, eyes in front. 85-125 ctenoid or cycloid scales. Head and nape naked or with scales. Teeth in bands, outer enlarged, canines. Palate edentate. Tongue rounded or truncate. Gillopening wide. D2 I 9-13. A I 8-13. Pelvic fraenum strong. Caudal usually exceeds head. **Biat** Seale, 1909 differs in longer dorsal and anal. 6 species, some inhabit burrows.

A. 9 dorsal rays **fasciatus**

- B. 10-11 dorsal rays :
 I. 9-10 anal rays :
 a. 6 dark bands **filifer**
 b. 7-8 light bands **octofasciatus**
 c. 6-7 oblique light bands **caeruleopunctatus**
 II. 11 anal rays. 1st D very high **pretoriusi**
 C. 12-13 dorsal rays **fasciiventris n. sp.**

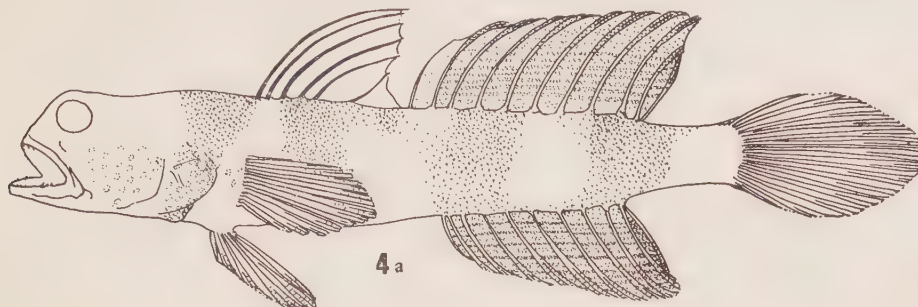


Fig. 4A. *Cryptocentrus fasciatus* (Plyfr). Type.
 (Drawing by Dr. E. Trewavas).

CRYPTOCENTRUS FASCIATUS (Playfair), 1866. **Gobiosoma fasciatum** Playfair 1866, 72. Playfair stated D VI+I 10. A I 9, and implied (**Gobiosoma**) scales absent. Dr. E. Trewavas has kindly examined the type (a varnished half skin) and sent me a sketch and data, from which the following are compiled. D VI+I 9. A I 9. Scales small, none on head. 1st D spine longest, about equals depth. P and pelvic short. Playfair stated body brown-red with 4 dark cross bands, 1st below 1st dorsal, last below end soft dorsal, many blue ocelli on head. Anal and caudal yellowish, 2nd D with 14 light blue dark edged lines. Yellow dots on P. Pelvics brown black. Length 5 ins., Zanzibar. Apparently a valid species, not since found.

CRYPTOCENTRUS FILIFER (Val.), 1837 (**PI 13, D**). **Gobius filifer** Val., 1837, 106. Bleeker & Pollen 1875, 77. (**knutteli** Blkr., 1858). D VI+I 10. A I 9. 100-120 scales. In life reddish green, marked as shown. Attains 130 mm. East Indies, recorded from Mauritius area. Not seen.

CRYPTOCENTRUS OCTOFASCIATUS Regan, 1908 (**PI 10, D**). Regan 1908, 254: Dupont 1927 (40), 238 (Seych.). Smith 1949b, 332, f 914 (Moz.); and 1956, 723 (Aldab.). D VI+I 10. A I 9. P 17-18. About 90 scales. 2+1+9 gillrakers. Marked as shown, an unmistakable fish. At Seychelles lives in association with a prawn (see **Obtortiophagus**). Attains 90 mm. Natal, E. Africa to Seychelles.

CRYPTOCENTRUS CAERULEOPUNCTATUS (Ruppell), 1828 (**PI 13, A**). **Gobius caeruleopunctatus** Ruppell, 1828, 134; and 1835, 137, Pl 32, f 3. Gunther 1861, 70; Klunzinger 1870, 479; Kossman & Rauber 1877, 19; Borsieri 1904, 204 (all Red Sea). (**pavoninus** Val., 1837). Not seen. D VI+I 10. A I 9, both higher than body. Scales minute. Shown as blue, with darker spots on head, shoulder, dorsal and anal, 6-7 oblique lighter bands, caudal blue with yellow submarginal band. To 6", Massaua, Red Sea, not known elsewhere.



Fig. 5. *Cryptocentrus pretoriusi* Smith, 61 mm.

CRYPTOCENTRUS PRETORIUSI Smith, 1958. Smith 1958, 127, f 2. D VI+I 11. A I 11. P 18. Scales 100. 16 lower gillrakers. Pondoland, S.A. Only the type known, 61 mm.



Fig. 5A. *Cryptocentrus fasciiventris* n. sp. Male, 110 mm.

***Cryptocentrus fasciiventris* n. sp. (Pl 9, F).**

D VI+I 13. A I 13. P 2+13-14+3. Scales about 85. Tr about 25. Gillrakers 5+1+9. Depth 6; head 3.7; pectoral 4.6-5; pelvic 5.2; caudal 3.3 in body. Eye 3.6 in head, equals snout. Eyes close together, reach dorsal profile, clearly erectile. Few lines of papillae on head, one below eye with branch back across cheek. Nostrils equally spaced on snout, anterior a tubule, hinder a wider pore. Gillopening wide, to below preopercle, upper rakers feeble, lower moderate, 2nd longest, $\frac{1}{4}$ eye, those in front shorter. Mouth moderate, little oblique, lower jaw projects, maxilla to below front of pupil. In each jaw moderate band of fine teeth, in lower variable, a series of larger teeth outside in front, 2 large recurved canines on side of jaw. In upper jaw 2-3 recurved caniniform teeth each side in front, outermost largest. Tongue bilobed. 4th dorsal spine longest, little less than body depth, soft rays increase to last, end of fin pointed, to beyond caudal base. Anal much like dorsal. Pectoral 1.25 in head, short of vent. Pelvic 1.3 in head, hind margin truncate, not to vent, fraenum strong. Caudal 1.15-1.2 times head. Scales cycloid, reach to shoulder where 2 dark spots above pectoral base are each margined by line of papillae, another vertical short line below 2nd dorsal ray. Scales on peduncle rapidly smaller in front, those from front of dorsal to pectoral base small, deeply embedded, irregular. Pectoral base and most of prepelvic area scaly; but isthmus, nape and head naked. Colour: preserved; yellowish brown, with dark markings as shown in Pl 9. Across hind 3rd of pelvic 4-5 narrow dark bars, little visible laterally. Two specimens, 90 and 107 mm. respectively, from Nosy Bé, Madagascar, in deepish water, muddy bottom, the former the type. Kindly sent by M. P. Fourmanoir, Fisheries Officer, Madagascar.

13. **Biat** Seale, 1909.

Genotype **Biat luzonica** Seale, 1909 = **fontanesii** Blkr., 1852. Exactly like **Cryptocentrus** Val., but with longer dorsal and anal.
BIAT SEWARDII (Playfair), 1866. **Gobius sewardii** Playfair 1866, 71. D VI+I 16. A I 16. Scales minute. Depth equals head, 4.7, caudal 3.3, in body. Eye 4 in head. Mouth oblique, outer teeth enlarged, a canine on side of lower jaw. Dorsal spines slightly filiform. Pale, light blue spots dorsally, transverse blue streaks below. Blue markings on cheek, opercle and pectoral base. Vertical fins clouded reddish. $4\frac{1}{2}$ inches. Zanzibar. Clearly not a fresh specimen, probably **fontanesii** Blkr., 1852. Not seen, after Plyfr.

14. **Obtortiphagus** Whitley, 1933.

Genotype **O. koumansi** Whitley, 1933. Body compressed. Small ctenoid scales, cycloid in front, some predorsal, head naked. Teeth in bands, outer larger, canines. Palate edentate. Tongue rounded. Gill-opening to below preopercle. Pelvic fraenum strong. Caudal about equals head.
OBTORTIOPHAGUS KOUMANSI Whitley, 1933 (Pl 10, A). Whitley 1933, 90, Pl XI, f 3. **Callogobius ocellatus** Herre 1935, 422; and 1936, 362, f 23 (Fiji). D VI+I 9-10. A I 9. P 1+15-16. Scales 60-65. Tr 18-19. Predorsal about 15. Gillrakers 3-4+1+10-11. Depth 4; head 3.6 in body. Eye 4 in head, equals snout, 5 times interorbital. Head and body compressed, many oblique and horizontal lines of papillae on cheek, vertical lines below eye and on opercle, one across snout, from which 2 to eyes. Front nostril tubular, close above lip, hinder a wide pore near eye. Gillopening to below preopercle margin, rakers short, longest in angle, those in front shorter. Mouth moderate, maxilla to below hind edge eye. Fine teeth in wide bands in each jaw, in lower, 8 front larger on each side, on side of jaw within 2 recurved canines. In upper jaw a pair of recurved canines in front each side, outer largest, on side of jaw outer teeth larger. Tongue rounded. 2nd and 3rd dorsal spines elongate, up to 1.1 times head, front rays of 2nd fin longer rearwards, end of fin little pointed, anal similar. Pectoral equals pelvic, about body depth, reach anus. Caudal rounded. Scales ctenoid, smaller in front, and cycloid below last dorsal spines, extend predorsal to before preopercle margin, there very small, embedded, irregular, belly and chest except front part scaly, few small scales on pectoral base, head naked. In life colourful, as shown in Pl 10; preserved, yellowish, most dark markings still visible, especially the 4 ocelli, and bars across side. 7 specimens, 35-44 mm. length, from Bazaruto, Pinda, Matemo and Wamizi Is. (Moz.). Previously known only from Queensland and Fiji, in each case from one specimen. This beautiful small Goby lives with a prawn in a burrow in sandy areas below low tide mark. The prawn seems to do all the work in keeping the burrow intact while the Goby remains nearby on guard. At the first sign of danger both vanish instantly into the burrow, tail first, the prawn first. The burrow must be

deep, as it is almost impossible to dig them out, our specimens taken by poison with great difficulty. Neither Whitley's nor Herre's descriptions and figures show elongate dorsal spines, Whitley states less than 50 scales, Herre about 63, but Whitley's figure shows more than 60 to gill opening. Dorsal spines probably elongate with age, one 35 mm. specimen has no elongate spines.

15. *Iotogobius* nov.

Genotype *I. malindiensis* n. sp. Head and body compressed. Many series of papillae on head. Minute scales, ctenoid on tail, cycloid on flanks, end before level of pelvic base, front parts and head naked. Teeth in bands, outer larger. Palate edentate. Tongue rounded. Gilloperine extends below. Pelvic fraenum strong. Caudal exceeds head. A genus erected with regret, but the peculiar characters appear to demand this.



Fig. 6. *Iotogobius malindiensis* n. sp. Type, 26 mm.

Iotogobius malindiensis n. sp.

D VI+I 10. A I 9. P 16. Scales 70. Tr 25. Gillrakers 2+1+10. Depth 5.2; head 3.4; pectoral, equals pelvic, 3.3; caudal 3 in body. Eye 5.2 in head, equals snout, 3 times interorbital. Several vertical and horizontal series of papillae on cheek, side of snout and chin. Front nostril a small tube over premaxilla, hinder a pore close before eye. Gilloperine to below preopercle margin, rakers short and stout. Mouth moderate, subvertical, maxilla barely below front of eye. Teeth in bands, 4-5 series, outer little larger. Tongue rounded. Dorsal spines short, $\frac{1}{2}$ body depth, soft rays longer, hinder to near caudal base. Anal similar. Pectoral to anal origin. Pelvics united, moderate fraenum, to vent. Scales small, hindmost larger, ctenoid, become cycloid below hind part of 2nd dorsal and anal. Scaling normal to about middle of soft dorsal and anal, anterior to this reduced, narrows to apex close behind pectoral axil; back, belly, chest and all anterior to pectoral base naked. Colour: brown, with odd silvery marks on body and fins, caudal dark with light blotches. Only the type, 26 mm., from Malindi.

16. *Ctenogobius* Gill, 1858.

Genotype *C. fasciatus* Gill, 1858. Head and body compressed. 30-50 ctenoid scales, a few on side of nape, rest of head naked. Teeth in bands, outer enlarged, canines in males. Palate edentate. Tongue truncate or bilobed. Gilloperine little exceeds pectoral base. D2 I 7-12. A I 7-11. Pelvic fraenum strong. Caudal more or less than head. 5 species in our area.

- | | |
|--|-----------------------|
| A. 5 dorsal spines, 3rd elongate. Hind rays in D & A elongate. 8 anal rays. | key |
| B. 6 dorsal spines : | |
| 1. Caudal lanceolate, much longer than head | acutipennis |
| 2. Caudal rounded, not or barely more than head : | |
| a. Black crossbars and ocelli | nocturnus |
| b. Yellowish, spotted. 1st D black behind. D VI+I 8-9. A I 9 | pavidus n. sp. |
| c. 2-3rd D spines long. 3 large blotches on side | nebulosus |

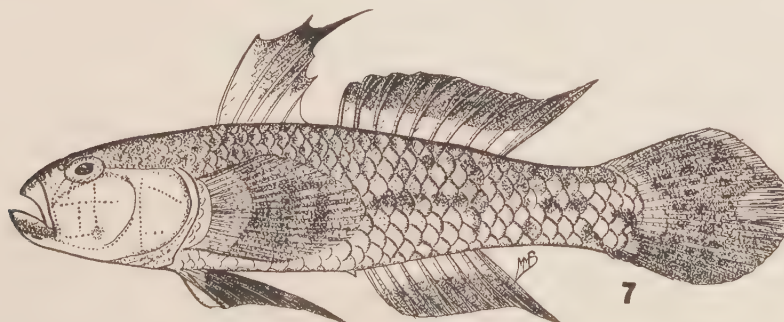


Fig. 7. *Ctenogobius key* (Smith). Type, 58 mm.

CTENOGOBIUS KEY Smith, 1947. Smith 1947, 807; and 1949b, 333, Pl 70, f 916. D V+I 9. A I 8. P 19.

29 scales. Tr 9-10. Gillrakers 1+1+7. 3 vertical series of papillae below eye and 2 horizontal. Olive yellow, fins dusky except basally. Only the type, 58 mm. Inhaca. Dorsal probably normally 6 spines. CTENOGOBIOUS ACUTIPENNIS (Val.), 1837 (Pl 10, H). (*Gobius* or *Oligolepis acutipennis* or *acutipinnis*). D VI+I 10-11. A I 10-11. P 20. 27-30 scales. Tr 7-8. 2+4-5 gillrakers. 2 rows of papillae along cheek, several down from eye, one vertical on opercle. Nostrils equally spaced on snout, anterior a tube, hinder a pore. Gillrakers fleshy. Tongue feebly emarginate. Dorsal spines filamentous, 3-4th longest, up to 2 in body. Pectoral to anal origin, pelvic to vent. Caudal pointed, much longer than head. Colour as shown in Pl 10, preserved more or less uniform, bar down and back from eye distinct. To 120 mm. Widespread in W. Pacific, Indian Ocean, found along E. Africa to Natal, where rare. Specimen figured from Inhaca. CTENOGOBIOUS NOCTURNUS Smith, 1956. Smith 1956, 723, f 2. D VI+I 10. A I 8. P 22. 30 scales. Tr 11. 5+1+11 gillrakers. Milk white, marked as shown. 33-50 mm., Aldabra and Assumption Is.

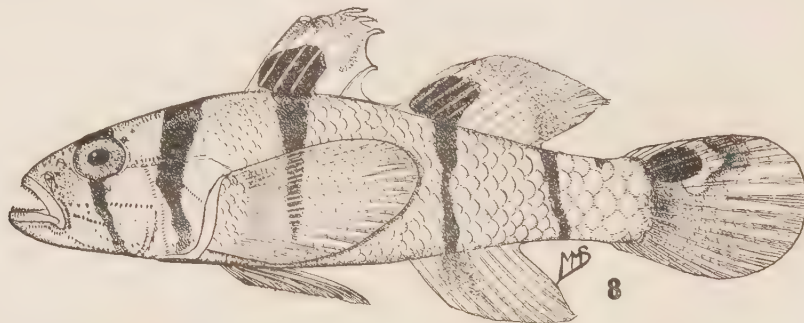


Fig. 8. *Ctenogobius nocturnus* Smith, 50 mm.

***Ctenogobius pavidus* n. sp.**

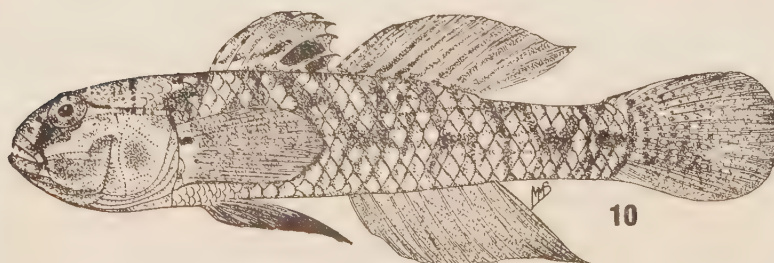
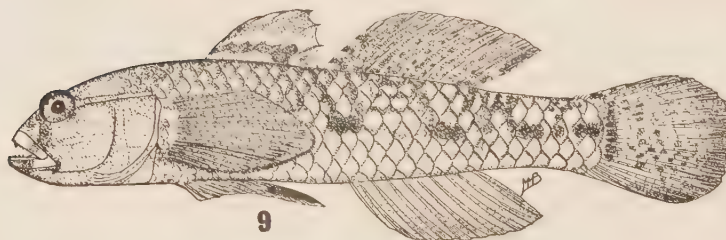


Fig. 9. *Ctenogobius pavidus* n. sp. Female, 52 mm. Fig. 10. Same, the type, male, 67 mm.

Described from the type. D VI+I 8-9. A I 9 (rarely 8). P 1+15-16. Scales 26-30. Tr 7-8. Gillrakers 2-3+1+6-8. Depth 4.6; head 3.5 in body. Eye 4 in head, 1.3 times snout. Head broad, slightly depressed, body moderately compressed, eyes adjacent. Papillate line below eye, 2 pairs of 2 lines across cheek, one from eye to maxilla, one down opercle. Nostrils equally spaced on snout, anterior a tube, hinder a pore. Gillopening little exceeds pectoral base, rakers moderate. Mouth small, slightly oblique, maxilla to front of eye. Teeth in broad bands in each jaw, outer series enlarged, in upper jaw to hind margin, in lower jaw to middle, the last 2 large, recurved, inner teeth little longer. Tongue subtruncate. 3rd dorsal spine longest, less than body depth, soft rays increase to the last, anal similar, both fins reach caudal base. Pectoral to above vent, pelvic with large fraenum, to anal origin. Caudal about equals head. Scales ctenoid, extend little beyond line dorsal origin to pectoral axil, front few cycloid, also those on pectoral base and prepelvic. Head and nape naked. Colour: live, dull olive with dark marks as shown in Fig. 10, blue ocellus behind 5th and 6th dorsal spines prominent, pelvic dusky, black apically. 9 specimens, 38-55 mm. length, all from about Ibo, one, 67 mm. length from Palma, Mozambique, the type. Related to and possibly identical with *grammatogaster* Blkr., 1875 from E. Indies and Philippines, at present held distinct. Koumans (1953, 183)

mentioned 3 specimens from Zanzibar which agree otherwise with **Ctenogobius cylindricus** Bleeker, 1875, but have 9 rays in dorsal and anal. They are probably this species. As shown elsewhere, **cylindricus** Bleeker, is probably the same as **Acentrogobius reichei** Blkr.

CTENOGOBIUS NEBULOSUS (Forsk), 1775. (PI 9, A). As **Gobius criniger** Val., and **G. nebulosus** Forsk, numerous records over whole W. Indian Ocean from 28°S northwards. (**criniger** Val., 1837: **brevifilis** Val., 1837: **caninus africana** Plyfr., 1866: **petersii** Steindachner, 1866: **auchenotaenia** Blkr., 1875: **criniger decaryi** Pellegrin, 1932). D VI+I 9. A I 9. P 18-19. 30-33 scales. Tr 11-12. 3+1+5 gillrakers. Several lines of papillae along cheek. Canines on side of lower jaw. 2-3rd dorsal spine elongated. Ctenoid scales, none median predorsal or on head. Cycloid scales on side of nape to above preopercle, below and on pectoral base, and prepelvic. Greenish yellow, with dark marks as shown. Attains 180 mm. Over most of tropical central and W. Pacific and Indian ocean to Durban, favours quiet shallow waters.

17. **Parachaeturichthys** Bleeker, 1874.

Genotype **Chaeturichthys polynema** Blkr., 1853. Head depressed, body little compressed. Short barbels on chin. Large ctenoid scales, on nape and opercle. Teeth in bands, outer enlarged, canines. Palate edentate. Tongue rounded. Gilloopening little more than pectoral base. Pelvic fraenum strong. Caudal exceeds head.

PARACHAETURICHTHYS POLYNEMA (Bleeker), 1853. Koumans 1953, 37, f 8. **Gobius polynema** Smith 1949, 334, f 920. D VI+I 9-11. A I 9-10. P 20-21. 28-30 scales. Tr 7-8. Predorsal 12-13. Gillrakers 2+1+9. Interorbital $\frac{1}{3}$ - $\frac{1}{2}$ eye. Greenish, with dark fins, marked black spot on caudal surrounded yellow. Attains 150 mm. Natal, tropical Indo-Pacific.

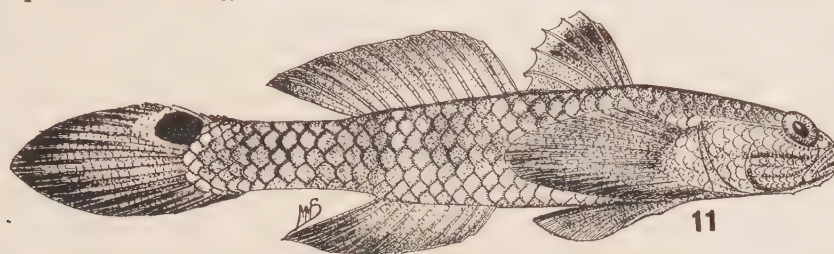


Fig. 11. **Parachaeturichthys polynema** (Blkr.), 76 mm.

18. **Stigmatogobius** Bleeker, 1874.

Genotype **Gobius pleurostigma** Blkr., 1849 = **sadanundio** H-B, 1822. Head depressed, body little compressed. 25-35 ctenoid scales, nape scaly to eyes, large unpaired scale in front, opercle and sometimes cheek scaly. Teeth in bands, outer larger. Maxilla often longer in males. Palate edentate. Tongue truncate or rounded. Gilloopening somewhat exceeds P base. D & A short. Pelvic fraenum strong. Caudal less to more than head. Indo-Pacific to India, not before recorded near Africa.

A. 24-25 scales. Tr 7 **versicolor**
B. 35 scales. Tr 10 **inhacae**

Stigmatogobius versicolor n. sp.

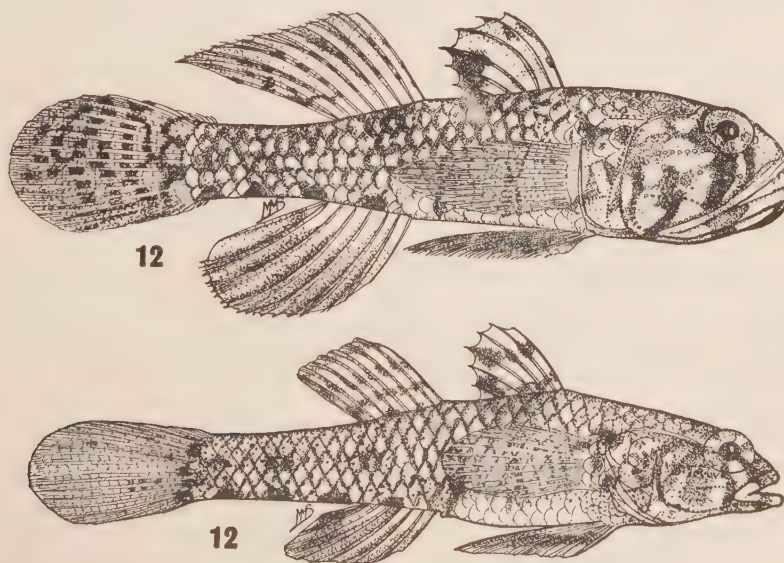


Fig. 12. **Stigmatogobius versicolor n. sp.**

Above, type, male, 30 mm.; below, female, 20 mm.

D VI+I 7. A I 6. P 15-16. Scales 24-25. Tr 7. Predorsal 7-8. Gillrakers 0+4-5. Depth 4; head 2.9 (male) -3.2 (fem.); pectoral 3.4; pelvic 3.3; caudal 3.5 in body. Eye 3.8 in head, 1.2 times snout. Head and body moderately compressed, eyes $\frac{1}{3}$ diameter apart. 2-3 lines of large papillae along cheek, 2 down preopercle margin, one down in front of opercle and 2 across. Front nostril a low tube over lip, hinder a pore close before eye. Gilloopening restricted, rakers low knobs. Mouth in males large, to behind eye, in females smaller, below front of eye. In males, a narrow band of fine teeth in each jaw, in upper, 5-6 enlarged caniniform in front each side. In lower, 1-2 large canines on side of jaw, a few teeth in front project forward. In females, only 2 series of fine teeth in lower jaw, outer enlarged; in upper 3 series, outer enlarged, no canines. Tongue subtruncate. Dorsal spines short, 2nd longest, $\frac{2}{3}$ body depth, soft rays higher, hinder longest, in males to beyond caudal base, anal similar. Pectoral about equals head, in males to beyond anal origin, in females to origin. Pelvic 1.2 in head, to anus in females, to anal origin in males. Caudal rounded. Scales ctenoid, larger on peduncle, become smaller in front, cycloid on shoulder, pectoral base, belly, chest and head. Nape fully scaly, predorsal scales to beyond hind eye level, 3 scales on opercle, rest of head naked. Colour: dark, marked as shown in Fig. 12. 22 specimens from a small tidal stream at Mahé, Seychelles, 20-30 mm. length, the type, male, 20 mm. Differs from all described species in combination of characters and markings.

Stigmatogobius inhacae n.sp. (Pl 9, G).

D VI+I 7-8. A I 6-8. P 14-15. Scales 34-35. Tr 10-11. Predorsal 15. Gillrakers 1+1+7. Depth 5.2; head 3.5; pectoral 4.2; pelvic 4.5; caudal 4 in body. Eye 3.6 in head, 1.4 times snout. Head depressed, body little compressed. Eyes own width apart, below skin. Many rows of papillae along cheek, especially before and below eye, 2 down front of opercle. Whole interorbital, snout and behind eyes beset with fine papillae, 2 series each side of chin. Front nostril short tube over lip, hinder a pore before eye. Gilloopening little more than pectoral base, rakers short points. Mouth moderate, maxilla to below front of pupil, fine teeth in narrow bands in each jaw, in upper few front teeth larger. Tongue truncate. 3-5th dorsal spines longest, $\frac{2}{3}$ body depth, soft rays little longer, increase to last, almost body depth. Anal similar. Pectoral 1.2 in head, not to anus. Pelvic 1.3 in head, fraenum strong, far short of anus. Caudal rounded. Scales ctenoid, become cycloid below hind part of 1st dorsal, and all along dorsal and anal base. Cycloid on belly, chest, pelvic base, nape and head, nape fully scaly to close behind eyes, front scales larger, median enlarged. 5 series on opercle, rest of head naked. Colour: dusky, with dark markings as shown in Pl 9. 6 specimens from Mahé and one from Inhaca, 18-40 mm. length, the type, 35 mm., Inhaca. Differs from all other species in combination of characters.

19. Acentrogobius Bleeker, 1874.

Genotype **Gobius chlorostigma** Blkr., 1849 = **viridipunctatus** Val., 1837. Head and body moderately compressed. 24-50 ctenoid scales, some on nape, sometimes on opercle. Teeth in bands, outer enlarged, palate edentate. Tongue rounded, truncate or bilobed. Gilloopening little wider than pectoral base. D2 I 6-15. A I 6-12. Sometimes upper P rays silklike. Pelvic fraenum strong. One of the largest, vaguest and most uneasy assemblage of species in this family, numerous species, some colourful, 16 now recorded from W. Indian Ocean, only 2-3 previously known.

- | | |
|---|-----------------------|
| A. 50 scales | multifasciatus |
| B. 31-40 scales : | |
| I. 32-34 scales, white mark on P base above | triangularis |
| II. 35-40 scales. Tr 12 : | |
| a. 15 predorsal scales | bontii |
| b. 25-27 predorsal scales | ferox |
| c. More than 20 predorsal scales | simplex |
| C. 24-30 scales : | |
| 1. D2 I 7. A I 6. Sc 26. PreD 11 | balteatops |
| 2. D2 I 8. A I 8 : | |
| a. 2nd D spine elongate | neilli |
| b. 2nd D spine not elongate | reichi |
| 3. D2 I 9. A I 9 : | |
| a. PreD 10 | audax |
| b. PreD 17-20 | caninus |
| 4. D2 I 9-11. A I 8-9. Upper P rays silklike | ornatus |
| 5. D2 I 9-10. A I 9. PreD 8 | aestuarius |
| 6. D2 I 10. A I 9. 28 scales. 7-8 preD | belissimus |
| 7. D2 I 10-11. A I 9. Upper P rays not silklike | spence |
| 8. D2 I 10-11. A I 10-11. Marked line below eye | cauerensis |
| 9. D2 I 10. A I 10. Black ocellus 5-6th D spine | signatus |



PLATE 10

A. *Obtortiphagus koumansi* (Whit). 51 mm. B. *Amblygobius albimaculatus* (Rupp.). 142 mm. C. *Vanderhorstia ornatissima* n.sp. Type, 57 mm. D. *Cryptocentrus octofasciatus* Rgn. 102 mm. E. *Drombus irrasus* n.sp. Type, 49 mm. F. *Quisquilius anthioides* n.sp. Type, 39 mm. G. *Zonogobius flammeus* n.sp. Type, 25 mm. H. *Ctenogobius acutipennis* (Val.) 70 mm. I. *Oxyurichthys papuensis* (Val). 180 mm. J. *Seychellea hectori* Smith, 49 mm. K, L & N. *Gobiodon rivulatus* (Rupp). K, 30 mm. L, 33 mm. N, 38 mm. M. *Gobiodon citrinus* (Rupp). 44 mm.

***Acentrogobius multifasciatus* n. sp.**

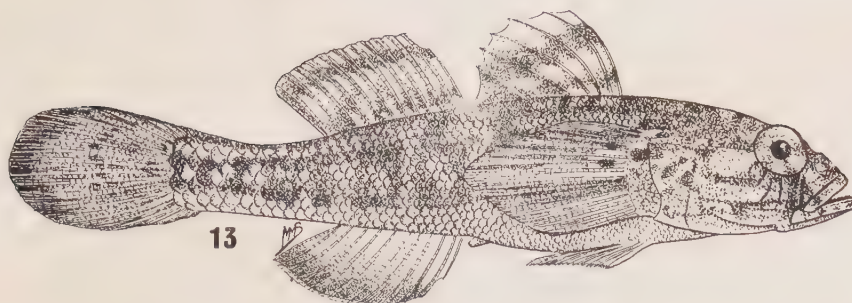


Fig. 13. *Acentrogobius multifasciatus* n. sp. Type, 41 mm.

D VI+I 11. A I 10. P 18. Scales 50. Tr 15-16. Predorsal 14. Gillrakers 2+1+8. Depth 4.2; head 3.3; pectoral 3.7; pelvic 5.2; caudal 4.4 in body. Eye 3.2 in head, 1.4 times snout, 4 times interorbital. Head and body moderately compressed. 5 subvertical lines of papillae below eye. Nostrils equally spaced on snout, anterior a low tube; hinder a pore. Mouth moderate, maxilla to below front of eye, lower jaw projects, fine teeth in bands in each jaw, outer series enlarged, no canines. Tongue truncate. 3rd dorsal spine longest, $\frac{3}{4}$ body depth, soft rays subequal. Anal similar. Pectoral to anal origin. Pelvic with strong fraenum, not to anus. Caudal rounded. Scales small, ctenoid, become cycloid on shoulder and nape where deeply embedded, predorsal scales $\frac{2}{3}$ to eye. Scales on pectoral base and prepelvic cycloid, head naked. One, 30 mm. length, Xora Mouth, South Africa, one 41 mm., from Mozambique Island, P.E.A., latter the type. Colour: preserved; yellowish, with 10-12 irregular short crossbars along side. Dark marks otherwise as shown in fig. 13. I have been unable to find any other species which this resembles.

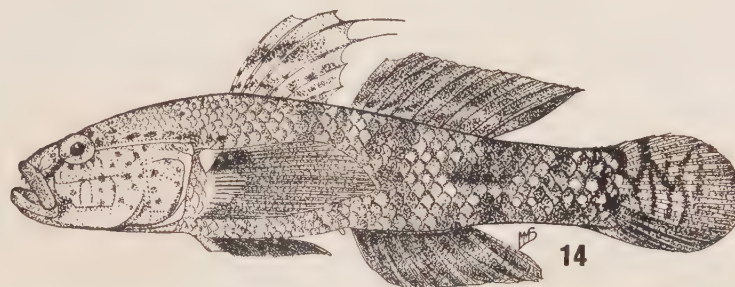


Fig. 14. *Acentrogobius triangularis* Weber, 1909, 60 mm.

ACENTROGOBIUS TRIANGULARIS Weber, 1909. **Gobius triangularis** Weber, 1909, 15; and 1913, 464, f 91. D VI+I 9. A I 7-8. P 1, 16-18, 1. Scales 32-34. Tr 9-10. Predorsal 13-14. Gillrakers 2+1+7. Depth 4; head 3.4 in body. Eye 4 in head, equals snout. Head broad, depressed, body moderately compressed, eyes adjacent. Front nostril a tube over lip, hinder a pore before eye. 2 horizontal series of papillae on cheek, 5-6 vertical, one vertical and 2 across on opercle. Gillopening little below pectoral base, rakers moderate. Mouth moderate, oblique, maxilla below front of eye. Teeth in moderate bands in each jaw, outer series enlarged, in upper to hind end of jaw, in lower end as 2 canines on side. Tongue rounded. 2-4th dorsal spines longer, 3rd up to head length, soft rays increase to last, reaches caudal base. Anal similar, last ray longest. Pectoral equals head, to anal origin. Pelvic 1.2 in head, short of vent, fraenum large. Caudal rounded. Scales ctenoid to nape, where smaller and cycloid, scaling almost to eye. Cycloid scales on pectoral base, front of belly and prepelvic; head naked. Colour: dark brown, with dark markings as shown in Fig. 14. Dark blotch on upper pectoral base with white area in front, yellow in life. Many specimens, 32-67 mm., from Delagoa Bay north along E. Africa, at many islands to Seychelles, not uncommon in mangrove areas. We differ from Koumans in accepting this as distinct from **bontii** Bleeker, 1849. Previously recorded from the E. Indies.

ACENTROGOBIUS BONTII Bleeker, 1849 (**PI 12, A**). **Gobius bontii** Bleeker, 1849, 27. D VI+I 9-10. A I 8. P 17. Scales 36. Tr 12. Predorsal 15. Gillrakers 2+1+6. Depth 4.4; head 3.7 in body. Eye 3.6 in head, equals snout. Eyes high up, close together, covered by skin. Several mucus canals along cheeks. Front nostril small tube above lip, hinder a pore close before eye. Gillopening restricted, hardly surpass pectoral base, rakers moderate. Mouth moderate, maxilla to below front of pupil, jaws subequal. In each jaw a band of small teeth, in lower outer series larger in front, in upper outer series larger, front teeth larger. Tongue feebly bilobed. 2nd-5th dorsal spines subequal, little more than $\frac{1}{2}$ body depth, soft rays higher, subequal, $\frac{2}{3}$ -1 body depth, anal slightly lower. Pectoral rounded, to above vent. Pelvic 1.2 in head,

fraenum strong, almost to vent. Caudal rounded. Scales ctenoid behind, become smaller and cycloid below 1st dorsal, on nape small, embedded, reach $\frac{2}{3}$ to eyes. Scales on belly, pectoral base and chest cycloid, head naked. Colour: dusky yellowish, with dark marks as shown in Pl 12. 2 specimens, 65 and 72 mm., from Bazaruto. Previously known from Central and W. tropical Indo-Pacific and India, not before found in W. Indian Ocean.

***Acentrogobius ferox* n. sp.**

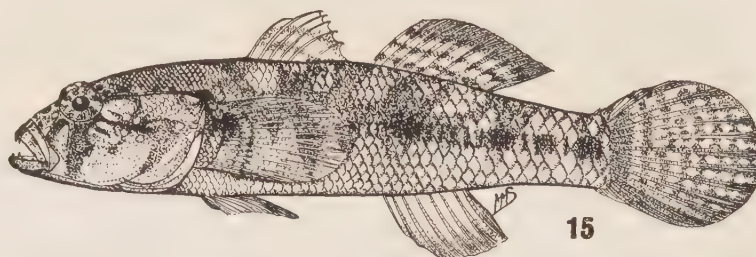


Fig. 15. *Acentrogobius ferox* n. sp. Type, 58 mm.

D VI+I 9. A I 7. P 18. Scales 35-39. Tr 12. Predorsal 25-27. Gillrakers 0+1+9. Depth 4.2; head 3.2; pectoral 4; pelvic 6; caudal 3.8 in body. Eye 4.4 in head, equals snout, 4 times interorbital. Head and body moderately compressed. 2-4 lines of papillae along cheek, 7-8 vertical. Gilloopening to near preopercle margin, no rakers above, that in angle long, lower rakers feeble. Mouth moderate, in each jaw band of 4-5 series, outer larger, that in upper to hind end. In lower jaw front teeth larger, hind tooth largest, recurved. Tongue truncate. Spinous dorsal low, 2nd spine longest, $\frac{1}{2}$ body depth, soft fin about same height. Anal similar. Pectoral not to vent. Pelvic not to vent, fraenum moderate. Caudal rounded. Scales ctenoid, largest on peduncle, smaller anteriorly and cycloid below 1st dorsal, predorsal smaller, embedded, to eyes. A patch of cycloid scales on upper part of opercle, rest of head naked. Scales on pectoral base, belly and prepelvic cycloid. Colour: dark brown, with odd markings on body and fins as shown in Fig. 15. 5 specimens from Zanzibar, 45-58 mm. length, the type, 58 mm. Related to **simplex** Sauvage 1898, possibly identical.

ACENTROGOBIUS SIMPLEX (Sauvage), 1875. Sauvage 1875, 365, Pl 41, f 4. Not seen. D VI+I 9-10. A I 7-8. 37-40 scales. Tr 12. Small scales on nape reach to eyes, a few on opercle. Strong canines. Brown, light spots on opercle. 2 dark bands on 1st D, anal dusky, soft D and caudal with brown spots. To 100 mm. Bagamoyo and Zanzibar.

***Acentrogobius balteatops* n. sp. (Pl 9, G).**

D VI+I 7. A I 6. P 19. Scales 26. Tr 10-11. Predorsal 11. Gillrakers 3+1+7. Depth 3.8; head 3.4; pectoral 3.5; pelvic 3.8; caudal 4 in body. Eye 5 in head, equals snout. Head and body moderately compressed. Eyes close together. No marked series of papillae on head. Both nostrils low tubes, front over lip, hinder before eye. Gilloopening little more than pectoral base, rakers short points. Mouth variable, in female to below front of eye, in male almost to hind margin eye. In each jaw fine teeth in bands, in upper outer series larger, in lower a few inner larger, recurved. Tongue rounded. 2nd and 3rd dorsal spines longest, less than body depth, soft rays increase to last, equal 2nd spine. Anal similar. Pectoral reaches beyond anal origin, also pelvics, fraenum strong. Caudal rounded. Scales ctenoid behind, become cycloid on nape, pectoral base, front of belly and prepelvic. Predorsal scaly to eyes. Most of opercle scaly, ctenoid, 16-17 scales in all, rest of head naked. Colour: preserved, yellowish, with dark marks as shown. Two specimens from Inhaca, female 31, male 38 mm., latter the type. Close to, possibly identical with **Vaimosa balteata** Herre, 1935 from far distant Waigiu Is., Pacific, at present kept apart on longer paired fins, different shape of head and much smaller eye than shown in male by Herre 1936, f 21. Assigned with some doubt to **Acentrogobius**, is more like **Stigmatogobius** Blkr., but eyes are adjacent and opercular scales strongly ctenoid. I suspect that the male practises buccal incubation.

ACENTROGOBIUS NEILLI Day, 1868 (Pl 11, L). **Gobius neilli** Day 1868, 152; and 1878, 290, Pl 62, f 4. D VI+I 8. A I 8. P 1, 16. Scales 28. Tr 8. Predorsal 5. Gillrakers 0+4. Depth 5; head 3; pectoral 4; pelvic 4; caudal 4 in body. Eye 5.3 in head, 1.1 in snout, 3 times interorbital. Head depressed, body moderately compressed. A papillate ridge along cheek, 1-2 vertical series. Front nostril a short tube over lip, hinder a pore close before eye. Gilloopening little forward, not to preopercle, rakers short, only on middle of lower arch. Mouth moderate, maxilla to below front of eye, lower jaw projects, teeth in bands, outer series larger. In lower jaw on side a recurved canine. Tongue truncate. 2nd dorsal spine filamentous, equals head, apex flattened, soft rays increase behind, last almost to caudal base. Anal similar. Pectoral 1.3 in head, to above anus. Pelvic 1.3 in head, to anal origin. Caudal acutely rounded. Scales ctenoid, become cycloid on side of nape, extend to above mid opercle, few series on mid line, most of nape naked, head naked. Scales on belly, chest and pectoral base cycloid. 2 specimens, 52 mm., from Pinda, and one, 62 mm., from Quiramba Island, near Ibo, P.E.A. At present held distinct from the much more numerous

A. reichei Blkr., 1853. A specimen from Ibo exactly resembles **Rhinogobius melanobranchus** Fowler, 1934, from Bali, Pacific. **Rhinogobius nebulosus** (Forsk.) described by Fowler, 1934 (82, fig. 23), is not that species, but **neilli** Day, almost exactly as illustrated here.

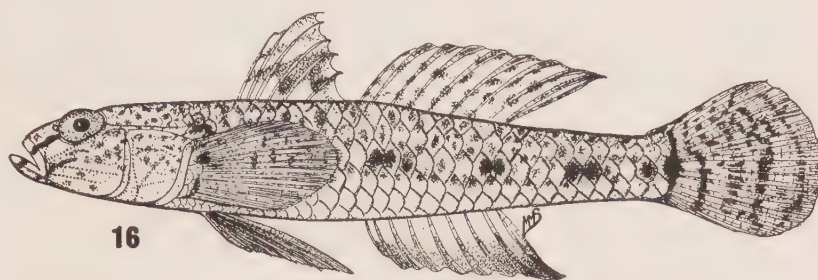


Fig. 16. *Acentrogobius reichei* (Blkr.).

ACENTROGOBIUS REICHEI (Bleeker), 1853. Koumans 1953, 77. (**Ctenogobius cylindricus** Blkr., 1875. **Gobius zanzibarensis** Sauvage, 1875). D VI+I 8. A I 8. P 16-18. 26-28 scales. Tr 7-8. Predorsal 2-3. Gill-rakers 3+1+7. Depth 5.4, head 3.8 in body. Eye 3.8 in head, 1.2 times snout. Head depressed, body compressed, eyes adjacent. Gillopening little surpass pectoral base, rakers moderate. Mouth small, maxilla to front of eye, teeth in bands, outer larger. Tongue truncate. 2nd and 3rd dorsal spines longest, barely exceed $\frac{1}{2}$ body depth, soft rays little higher, anal similar. Pectoral to above vent. Pelvics united, with moderate fraenum, reach anal. Ctenoid scales to shoulder, where cycloid, 2-3 median predorsal, on side of nape 6-7. Head naked. Preserved; yellowish, with many spots on head, body and fins, most prominent 5 series of double dark spots along sides, one at caudal base. Dark bar front eye to maxilla, across under chin. Other markings as shown. Many specimens, 30-65 mm., from Mozambique Is. northwards, and at all islands to Seychelles. Usually more densely spotted than the one shown here, none have a long 2nd dorsal spine; some are females. We differ from Koumans in keeping this separate from **neilli** Day.

***Acentrogobius audax* n. sp.**

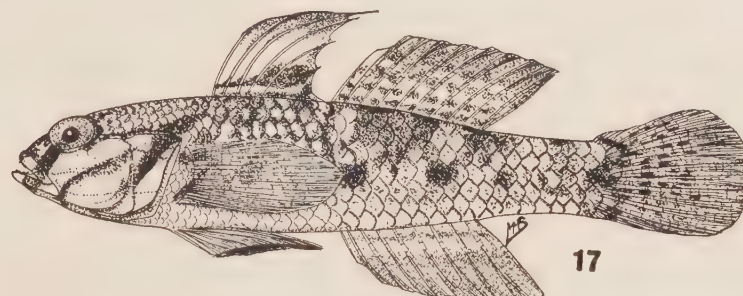


Fig. 17. *Acentrogobius audax* n. sp. Type, 55 mm.

D VI+I 9. A I 9. P 18. Scales 28. Tr 8. Predorsal 10. Gillrakers 2+1+8. Depth 4.2; head 3.5; pectoral 3.6; pelvic 3.8; in body. Eye 3.6 in head, 1.2 times snout, 4 times interorbital. Head and body compressed. A row of papillae below eye, a double row across middle of cheek, one across lower cheek. Front nostril a low tube near above lip, hinder a pore before eye. Gillopening forward, almost below preopercle margin, rakers moderate. Mouth moderate, maxilla below front of eye, teeth in bands, in upper jaw outer series larger. In lower jaw front series larger, recurved canine on side. Tongue rounded. 2-4th dorsal spines elongate, 3rd longest, exceeds body depth, soft rays lower, hinder almost reach caudal base. Anal similar. Pectoral to anal origin, pelvic with strong fraenum, reach vent. Large ctenoid scales, become smaller and cycloid on nape, predorsal almost to eyes. Cycloid on pectoral base, belly and prepelvic. Head naked. Preserved: yellowish, with dark marks as shown, oblique bar on opercle and below eye prominent. The type, 55 mm. length, from Ibo. I cannot find any known species with which this agrees.

ACENTROGOBIUS CANINUS (Valenciennes), 1837 (Pl 13, G). **Gobius caninus** Playfair 1867, 862, (Sey.). Bleeker & Pollen 1875, 103; and Sauvage 1875, 520 (Rec. only). Pfeffer 1893, 13 (E.Afr.). Pellegrin 1933, 140, f 80 (Madag.). (**grandinosus** E & S, 1841). D VI+I 9. A I 9. P 18-19. 30 scales. Tr 9. Predorsal 17-20. Depth 4-5, head 3.8-4 in body. Eye 3.5-4 in head, interorbital narrow. Canines in lower jaw. 2-3rd D spines may be elongate. Ctenoid scales, cycloid predorsal to near eyes and on opercle. Colour, preserved; yellowish, marked as shown. In life spot at scapula blue. Attains 130 mm. Wide area of central and W. Pacific; recorded from Indian Ocean to Madagascar and E. Africa. We found no specimen and suspect that Indian Ocean records were based on **nebulosus** Forskal, 1775, as e.g. Playfair 1867, 71, Pl 9, f 1. (Zanz.).

Acentrogobius aestuarius n. sp.

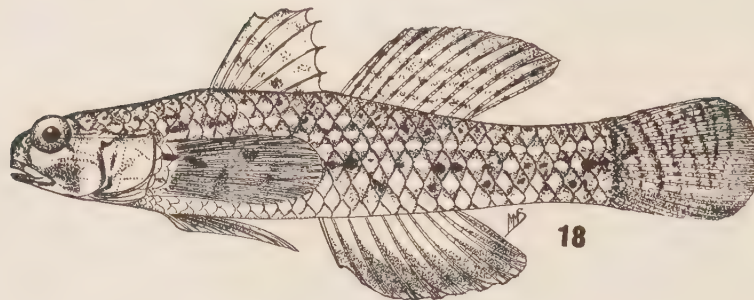


Fig. 18. *Acentrogobius aestuarius* n. sp. Type.

D VI+I 9-10. A I 9. P 1, 16, 1. Scales 27. Tr 6-7. Predorsal 8. Gillrakers 0+1+4. Depth 4.6, head 4.1; pectoral 3.4; pelvic 4.2; caudal 3.9 in body. Eye 3.4 in head, 1.4 times snout. Head cylindrical, body little compressed. Eyes dorsal, contiguous. Few papillae on head, 2-3 series along cheek. Front nostril a tube midway between eye and lip, the hinder a pore at front of eye. Gillopening extend barely below pectoral base, rakers low, fleshy. Mouth small, snout rounded, lower jaw included, maxilla reaches below middle of eye. Fine teeth in narrow bands in each jaw, outer little larger, no canines. Tongue rounded. 2-4th dorsal spines longest, four-fifths body depth, soft rays subequal to 3rd spine. Anal similar. Pectoral 1.2 times head, to anal origin. Pelvic 1.1 in head, to vent. Scales ctenoid, become cycloid on nape, prepelvic and pectoral base. Scaling to hind margin eye, head naked. Colour; preserved, yellowish, with dark marks as shown in Fig. 18. 2 specimens from Inhambane, 42 and 44 mm. length, the latter the type. Related to *globiceps* Hora, from India but differs in markings, lower jaw included and naked head.

Acentrogobius belissimus n. sp. (Pl 11, A).

D VI+I 10. A I 9. P 2+16-17. Scales 28. Tr 8. Predorsal 7-8. Gillrakers 0 = 1+4. Depth equals head, 3.8, pectoral 3.3, pelvic 4 in body. Eye 4.5 in head, 1.6 in snout, 4 times interorbital. Head and body compressed, eyes high, clearly erectile. Few series of obscure papillae on nape. Nostrils equidistant on snout, anterior a low tube, hinder a pore. Gillopening little exceed pectoral base, rakers fleshy, about $\frac{1}{4}$ eye. Mouth little oblique, snout rounded, lower jaw shorter, maxilla to below front of eye. In each jaw moderate band of fine pointed teeth, in upper whole outer series larger, front few teeth largest. In lower jaw 6 front teeth on each side larger, hindmost curved outwards, no canines. Tongue rounded. Dorsal spines increase to the 3-4th, latter $1\frac{1}{2}$ times body depth, soft rays increase to last, 1.1 times body depth, end of fin pointed, reaches caudal. Anal similar. Pectoral and pelvic reach beyond anal origin. Caudal 1.5 times head. Body scaly, also nape, pectoral base and cheeks, all ctenoid, those on chest and prepelvic cycloid. 4-5 series on cheek, 5-6 on opercle. 2 specimens, 142 mm., from Zanzibar, and the type, 125 mm., from Pinda, Mozambique. In life, brilliant as shown in Pl 11. Preserved, yellowish, with dark marks as in Pl 11. Related to *A. hendersoni* Herre, 1936 from Singapore, at present held to differ in the longer fins and in more scales on cheek and opercle, also in markings.

ACENTROGOBIUS ORNATUS (Ruppell), 1828 (Pl 12, G). *Gobius ornatus* Ruppell 1828, 135; and 1838, 137. *Acentrogobius ornatus* Koumans, 1953, 71. *Sicyopterus maritimus* Fourmanoir 1954, 205, f 1. (*ventralis* Val., 1837; *elegans* Fowler, 1928). D VI+I 10-11. A I 8-9. P 18-20. 28-30 scales. Tr 8. Predorsal 10-12. Upper P rays silklike. Colour variable, greenish, with rows of dark spots. Attains 100 mm. North Mozambique northwards, over most of tropical Indian and W. and C. Pacific.

ACENTROGOBIUS CAUERENSIS (Bleeker), 1853 (Pl 11, C & D). Numerous records from whole W. Indian Ocean as *Gobius capistratus* Peters, 1855: *Gobius cauerensis* Blkr. and *Gobius ophthalmotaenia* Blkr. Smith 1949b, No. 321, Pl 72, f 321. Koumans 1953, 68. D VI+I 10-11. A I 10-11. P 15-17. 30 scales. Tr 9. Predorsal 8-10. Colour as shown. Attains 80 mm. Abundant. Natal northwards to central Pacific.

ACENTROGOBIUS SIGNATUS (Peters), 1855. Peters 1855, 253 (Moz.). Sauvage 1875, 362, Pl 38, f 4. Not seen. D VI+I 10. A I 10. 30 scales. Tr 9. Depth 6, head 5 in total length. Maxilla to front of eye, outer teeth enlarged. Caudal equals head. No P silklike rays. Greenish, irregular brown spots. Blue spots on head. Pectorals and pelvic with white spots, pelvics dusky at apex. Large black spot 5-6th D spine. Attains 70 mm. Probably falls here but insufficiently defined—Sauvage's figure (*loc. cit*) differs from the text, showing D2 I 9, A I 8, 25 scales, nuchal scaling doubtful.

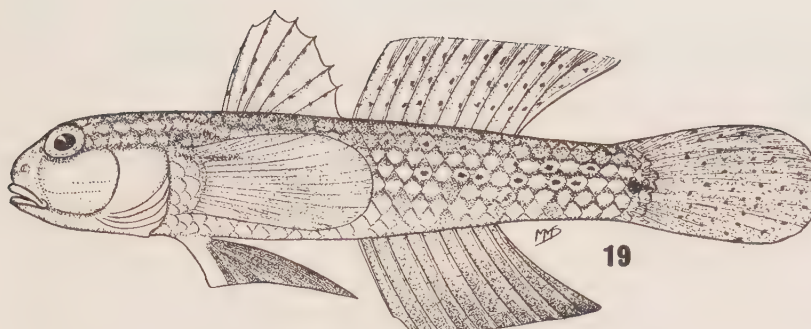


Fig. 19. *Acentrogobius spence* (Smith). 50 mm.

ACENTROGOBIUS SPENCE (Smith), 1946. Smith 1946, 809; and 1949b, No. 921, f 921. D VI+I 10-11. A I 9. P 19. 28-29 scales. Tr 8. Predorsal 8. No upper silklike P rays. Sandy grey with faint dark marks as shown. Closely related to *ornatus* Ruppell, differs in absence of silklike P rays, fewer predorsal scales and lighter markings. Attains 55 mm.

20. *Oxyurichthys* Bleeker, 1860.

Genotype **Gobius belosso** Blkr., 1854 = **papuensis** Val., 1837. Head and body compressed, low crest on nape. 50-100 ctenoid scales, some on nape, opercle naked. Teeth in upper jaw large, in one row, 2-4 in lower. Palate edentate. Tongue rounded. Gillopening slightly exceeds pectoral base. D2 I 12-13. A I 13-14. Pelvic fraenum strong. Caudal exceeds head. Dorsal spines filamentous in males.

A. Plain tentacle on eye **tentacularis**

B. No tentacle or teat-shaped one :

I. 50-55 scales **microlepis**

II. 80-90 scales. Prepelvic scaly **papuensis**

III. More than 100 scales. Prepelvic naked **lemayi**

OXYURICHTHYS TENTACULARIS (Val.), 1837 (**PI 9, E**). (**macrurus** Blkr., 1849 : **ophthalmonema** Blkr., 1856). Smith 1953, 521 (SA). D VI+I 12. A I 12-13. P 20-22. Scales 55-65. Tr 15-16. Predorsal 25. Gillrakers 3+1+5. A plain tentacle on upper part of eye. A low median fleshy crest predorsal. Gillrakers fleshy, upper bifid. Scales ctenoid, cycloid before 2nd dorsal origin. Median predorsal naked, a small patch of scales below, a small patch prepelvic. Live colour unknown, preserved uniform brown. One, 95 mm., Zanzibar; one 165 mm., Xora, S. Africa. Previously known over wide area of tropical Indo-Pacific.

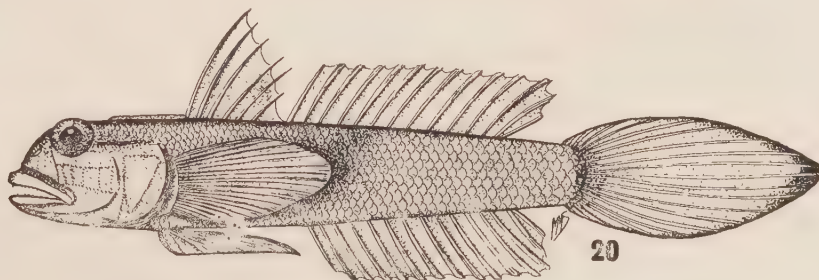


Fig. 20. *Oxyurichthys microlepis* (Blkr.), 90 mm.

OXYURICHTHYS MICROLEPIS (Blkr.), 1849. (**cristatus** Day, 1873 : **nuchalis** Barnard, 1297). **Gobius cristatus** Smith 1949b, 336, f 929. **Oxyurichthys microlepis** Morrow 1954, 816 (Kenya). D VI+I 12-13. A I 13. P 20-22. Scales about 55. Tr 14. Predorsal 17. Gillrakers 1+1+3. Low dermal crest median predorsal, naked, side of nape scaly. Pectoral base, prepelvic and head naked. Caudal almost twice head. Greenish above, pearly below, side with violet blotches, blue spots on head and body. Vertical fins pink, 1st D with 2 blue lines, 2nd with blue spots, pectoral orange, violet spotted below, anal pink, margin yellow and violet, pelvic orange, body violet. Caudal with black spots, lower edge violet and reddish streaks behind. To 135 mm. Tropical Indo-Pacific, India, now recorded from Natal, Delagoa Bay and Kenya.

OXYURICHTHYS PAPUENSIS (Val.), 1837 (**PI 10, I**). **Apocryptes petersii** Klunzinger, 1870, 480 (Red Sea); Borsieri 1904, 207 (Eritrea). **Oxyurichthys papuensis** Smith 1949b, 507, f 913a. Koumans 1953, 46, f 12. (**belosso** Blkr. 1954; **oculomirus** Herre 1927, 256). D VI+I 12. A I 13. P 21-23. 70-90 scales. Tr 20. Predorsal 18-25. Gillrakers 3+1+5. Low dermal crest median predorsal. Eye plain or with teat-shaped process above. Gillrakers fleshy, upper bifid. Scales ctenoid, cycloid from 2nd dorsal origin. Median predorsal naked, scales on side of nape. Pectoral base and head naked, large patch of prepelvic scales. Caudal up to twice head. In life colourful as shown in Pl 10. Preserved: brownish, odd dark marks,

especially blotch at caudal base. To 180 mm. Widespread in tropical Indo-Pacific, now recorded from Delagoa Bay northwards, weedy quiet areas. All my specimens have the ocular process. *OXYURICHTHYS LEMAYI* (Smith), 1947 (**PI 12, J** Male). *Gobiichthys lemayi* Smith 1947, 811; and 1949b, 331, Pl 69, f 913. D VI+I 12. A I 13. P 22. 100-110 scales. Tr about 24. 25 predorsal. Gillrakers 3+1+5. Low median predorsal crest. Eye plain. Gillrakers fleshy, upper bifid. Scales ctenoid, cycloid from 2nd D origin. Median predorsal naked, scales on side of nape. Pectoral base, prepelvic and head naked. Caudal in male 1.5 times head, and front 5 D spines elongate. Colour in life brilliant (Smith 1949, above), pinkish, with green and red marks in front, fins red spotted, pelvic streaked violet. Preserved almost uniform brown. Male, 152 mm., female 160 mm., Delagoa Bay, the former the type. At present held distinct from *papuensis* Val., on colour, smaller scales, naked prepelvic and absence of dark spot at caudal base.

21. *Amblygobius* Bleeker, 1874.

Bleeker 1874, 322. Genotype *Gobius sphynx* Val., 1837. Head and body compressed. 50-80 ctenoid scales, cycloid over nape and opercle. Teeth in 2-3 rows, outer enlarged, caniniform. Palate edentate. Tongue truncate. Gilloopening little more than pectoral base. D2 and A I 13-16. Pelvic fraenum moderate. Caudal less or more than head. Few species, 2 in our area.

A. 20 predorsal scales. 4th dorsal spine less than head **sphynx**
B. 30 predorsal scales. 4th dorsal spine more than head **albimaculatus**

AMBLYGObIUS SPHYNX (Valenciennes), 1837 (**PI 11, G**). *Gobius sphynx* Val., 1837, 93. *Gobius rubro-taeniatus* Lienard 1839, 39, Sauvage 1875, 358. Bleeker 1879, 17 (all Maur.). *Gobius stagon* Smith 1949b, 337, f 932 (Inhaca). D VI+I 13-15. A I 14. P 17-19. 50-52 scales. Tr 18-20. 20-22 predorsal. Attains 180 mm. Weedy areas; Africa N. of Inhaca; Madag. Maur.

AMBLYGObIUS ALBIMACULATUS (Ruppell), 1828 (**PI 10, B**). *Gobius albimaculatus* Ruppell, 1828, 135. Smith 1949, 337, f 933; and 1956 723 (Ald.). (*semicinctus* Benn, 1833; *papilio* Val., 1837; *phalaena* Val., 1837; *quinqueocellatus* Val., 1837; *fasciatus* Macleay, 1884; *annulatus* de Vis, 1884; *vonbondei* Smith, 1936. D VI+I 13-15. A I 12-14. P 17-20. 50-55 scales. Tr 18-20. About 30 predorsal. Attains 180 mm. Extends from Durban over most of tropical Indo-Pacific, weedy areas. Colour and markings variable, often narrow bars across belly, especially in Seychelles specimens.

22. *Seychellea* Smith, 1956.

Genotype *S. hectori* Smith, 1956. Head and body compressed. Small ctenoid or cycloid scales, cover nape, not to eyes, head naked. Teeth in 2 rows in each jaw, outer canines. Palate edentate. Tongue truncate. Gilloopening over pectoral base. Pelvic fraenum marked. Caudal less than head.

A. D & A 15-17 rays. 50-54 scales **hectori**
B. D & A 14 rays. 65-70 scales **tekoma** *n. sp.*

SEYCHELLEA HECTORI Smith, 1956 (**PI 10, J**). Smith 1956, 726, f 3. D V+I 16-17. A I 15-16. P 16. 50-55 scales. Tr 17-18. Predorsal 23-25, not to eyes. 0+4-5 gillrakers. Colour as shown in Pl 10, J. Attains 50 mm. Aldabra, Mahé (Seych.).

Seychellea tekoma *n. sp.*

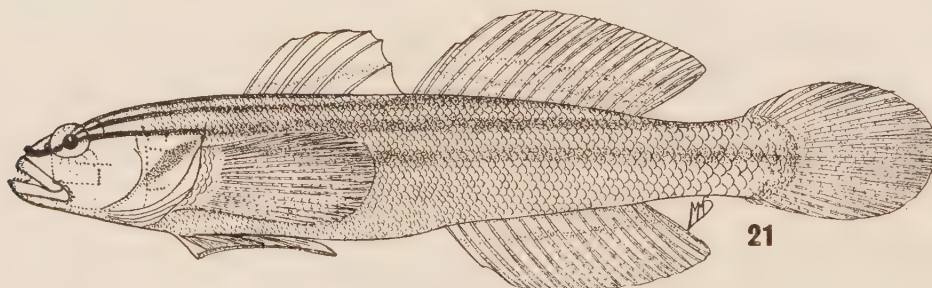


Fig. 21. *Seychellea tekoma* *n. sp.* Type, 52 mm.

D VI+I 14. A I 14. P 16-17. Scales 65-70. Tr. 25. Predorsal about 16. Gillrakers 0+6. Depth 4.6-5; head 3.8; pectoral equals pelvic 4; caudal 4.2 in body. Eye 4-4.5 in head, equals snout, 4 times interorbital. Two feeble lines of papillae along cheek, several vertical, one on opercle. Front nostril tubular, hinder a pore before eye. Gilloopening restricted, rakers feeble, only on middle of lower arch. Mouth moderate, maxilla to below pupil, fine teeth in bands in each jaw; in upper, outer larger, exsert; in lower, front teeth larger, exsert, ending in outward flaring canine on side. Tongue rounded. 4th dorsal spine longest, $\frac{2}{3}$ body depth, soft rays higher, midrays longest, shorter hindwards, anal similar. Pectoral 1.2 in head, not to vent. Pelvic 1.3 in head, not to vent, fraenum strong. Caudal rounded. Small cycloid scales, largest on peduncle, smaller forwards, cover side of nape $\frac{2}{3}$ to eye, midline naked. Pectoral base and prepelvic area scaly, head naked. Colour: preserved, milky yellow, with faint stripes, fins colourless. Round snout a dark line, including nostrils, runs back through eye. 4 specimens, 46-52 mm., Tekomaji Is. (Moz.), the type, 52 mm. Related

to **Amblygobius myersi** Herre, 1936 from Solomon Is., differs in absence of scales from opercle, nape naked on midline and in front, an extra anal ray, and scales cycloid.

23. **Flabelligobius** Smith, 1956.

Genotype **F. fourmanoiri** Smith, 1956. Head and body little compressed. Minute embedded cycloid scales, obsolete at shoulder, head naked. Fine teeth in bands, outer and inner enlarged, canines. Palate edentate. Tongue rounded. Gillopening restricted to pectoral base. Pelvic fraenum strong. Caudal exceeds head. The genotype and possibly one other species, easily distinguished.

FLABELLIGOBIUS FOURMANOIRI Smith, 1956. Smith 1956, 553, f 1. D VI+I 12. A I 12. P 16. 125-130 scales from pectoral to caudal base. 3+1+5 gillrakers. 16 vertical series of papillae along side. 20 moderate caniniform teeth round front of upper jaw, 16 similar in front of lower. Markings as shown. One specimen, 95 mm., from 10 fathoms off Nosy-Bé (Madag.).

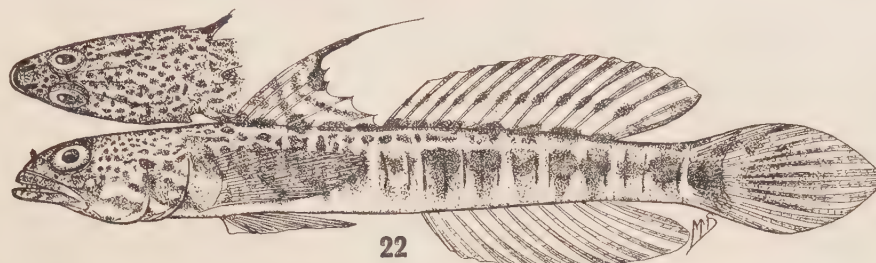


Fig. 22. **Flabelligobius fourmanoiri** Smith, Type, 95 mm.

FLABELLIGOBIUS ARABICUS (Gmel.Linn), 1789 (**PI 13, M**). **Gobius anguillaris** (non Linn) Forskal 1775, 23. **Gobius arabicus** Ruppell 1835, 139, Pl 32, f 5; Gunther 1861, 74. Tortonese 1937, 242, f 6: and 1947, 88 (all Red Sea). Steindachner 1902, 146 (Arabia). Not seen. I am greatly obliged to Dr. Tortonese for much of the information below. D VI+I 12-13. A I 10-11. P 16. Scales cycloid, minute. Gillopening little more than P base. Ruppell's colour plate shows body yellowbrown, spotted blue and red, also head, vertical fins light, caudal spotted, upper and lower margins dark, pectoral yellow with red crosslines. Preserved, brown with 8 vague dark crossbars, spots on upper parts, white dots on head. Attains 135 mm. Red Sea, Arabia. With restricted gill opening and minute cycloid scales (Dr. Tortonese), probably falls here rather than in **Cryptocentrus** Val.

24. **Pandaka** Herre, 1927.

Genotype **P. pusilla** Herre, 1927. Head and body compressed. Large ctenoid scales, most of nape and head naked. Teeth in 2 rows each jaw, outer little larger. Tongue truncate. D2 I 6-7. A I 5-6. Pelvic fraenum feeble. Caudal less than head. Pacific, not before found in the Indian Ocean.

Pandaka minuta n. sp.



Fig. 23. **Pandaka minuta n. sp.** Type, 16 mm.

D VI+I 6. A I 6. P 14-16. Scales 22. Tr 6. Predorsal 3-4. Depth 4.2; head 3.2; pectoral 4.4; pelvic 5; caudal 3.6 in body. Eye 3 in head, twice snout and interorbital. Nostrils shortly tubular, close together. Gillopening little exceeds pectoral base. Mouth small, oblique, maxilla below front of eye, teeth in 2 rows in each jaw. 2nd and 3rd dorsal spines longest, three-fifths body depth, 2nd soft ray longest. Anal similar. Pectoral to above anal origin. Pelvics united, fraenum feeble, not to anus. Caudal rounded. Scales ctenoid, 3-4 predorsal, rest of nape and head naked, pectoral base and prepelvic naked. Colour: preserved, yellowish, with dark marks as shown. 10 specimens, 12-16 mm. length, from Ibo and Wamizi Islands (Moz.), the type, 16 mm., Wamizi. Related to **pygmaea** Herre, 1927 from Philippines, differs in predorsal scales and markings.

25. **Feia** nov.

Genotype **F. nympa n. sp.** Head depressed, body cylindrical. Eyes reduced. Small concealed cycloid scales on hind part of body, few before 2nd dorsal. Teeth in narrow bands, outer larger. Palate edentate.

Tongue rounded. Gilloping restricted. Pelvics barely united, no fraenum. Caudal less than head. Closely related to **Abranches** Smith, 1947 but differs in less developed scaling and feeble union of pelvics.

***Feia nympha* n. sp.**

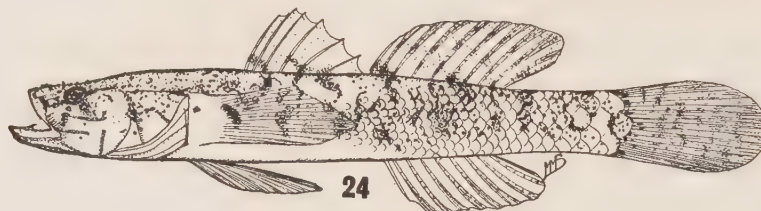


Fig. 24. *Feia nympha* n. sp. Type.

D VI+I 9. A I 8. P 15. Scales 22 to pectoral tip. Tr about 11. Gillrakers 2+1+9. Depth 6.3; head 3.6; pectoral 4.0; pelvic 4.3; caudal 3.8 in body. Eye 7 in head, 1.6 in snout. Head broad, depressed, body cylindrical. Eyes dorsal, small, below skin, a diameter apart. Front nostril a wide tube, hinder a pore close behind. A skinny flap with fine ciliate margin over maxilla along cheek, another above along below eye, a 3rd down, ventral on cheek, 2 oblique series of papillae on opercle. Well defined series of papillae on chin. Odd subtubular small papillae scattered over head. Gilloping little surpass pectoral base, rakers well developed. Mouth sub-vertical, maxilla to below front of eye, fine teeth in bands in 2-3 rows in each jaw, outer larger, in lower jaw 2 strong recurved canines on side, one row of small teeth behind. 2nd and 3rd dorsal spines longest, about four-fifths body depth, soft rays higher, increase posteriorly, anal little shorter. Pectoral to anus, pelvics barely united, no fraenum, not to anus. Caudal rounded. Small cycloid scales on hind part of body, larger on peduncle, become obsolete below end of 1st dorsal, rest of fish naked. Live colour: yellowish, with dark marks on body and head, chin dark. Dorsal spotted and barred, few spots on caudal, a dark mark near pectoral base, odd spots on rays. Only the type, 27 mm., from Pinda. Clearly a degenerate fish.

26. ***Monishia* nov.**

Genotype ***Bathygobius william*** Smith, 1947. Head depressed, body little compressed. Rows of papillae on cheek. 30-45 scales, behind ctenoid, in front cycloid, none on nape, head or prepelvic. Teeth in bands, outer larger. Palate edentate. Tongue truncate or bilobed. Gilloping only over P. base, 1st gill slit partly or fully closed by membrane. Upper P rays silklike. Pelvics united, fraenum weak or moderate. Differs from ***Bathygobius*** Blkr., in lacking scales on the nape. 3 species.

- | | |
|--|------------------------------|
| A. 30-33 scales. 9 dorsal rays | <i>oculata</i> n. sp. |
| B. 35-38 scales. 11-12 dorsal rays. Base of P and midbelly scaly | <i>sordida</i> n. sp. |
| C. 39-43 scales. 10-11 dorsal rays. Base of P and midbelly naked | <i>william</i> |

***Monishia oculata* n. sp. (PI 9, H)**

D VI+I 9. A I 8. P 5+12. Scales 30-33. Tr. 12-13. Gillrakers 1+1+0. Depth 4.2; head 3.6; pectoral 3.2; pelvic 4.5; caudal 3.8 in body. Eye 3 in head, twice snout. Head broad, depressed, also front of body, little compressed behind. Eyes adjacent, below skin, subdorsal, erectile. Several papillate ridges on side of head, one each side of chin and along preopercle margin. Nostrils tubular, front over lip, hinder longer, close before eye. Gilloping restricted, 1st arch closed by membrane to angle, no rakers on lower limb. Mouth moderate, oblique, maxilla to below mid-eye, lower jaw projects little. In upper jaw an outer series of moderate curved teeth, behind this 2-3 series of minute teeth, behind in front 2-3 larger teeth each side. In lower jaw a series of 4-5 larger teeth in front each side, behind these a narrow band of minute teeth, and inside 4-5 recurved larger teeth each side. Tongue bilobed. 4th and 5th dorsal spines longest, rather less than body depth, soft rays slightly higher in front, hinder shorter. Anal similar. Pectoral to anal origin, 5-6th upper rays silklike. Pelvics united, not to anus, rays apically digitate, fraenum weak. Caudal rounded. Scales ctenoid, deeply embedded, covered with mucus, become cycloid below front of 2nd dorsal, none before line dorsal origin to pectoral axil; head, nape, chest, belly and pectoral base naked. Live colour: yellowish, barred and with close set dark speckles as shown. Pelvic dusky, speckled dark. Many specimens, 12-28 mm. length, from Inhaca north along E. Africa, and all islands to Seychelles, in sandy coral pools at low tide. The type, 25 mm., Mahé. A curious sluggish small Goby found over a wide area, obtained chiefly by poison. We came to name this "Goggle goby."

***Monishia sordida* n. sp.**

D VI+I 11-12. A I 9. P 6+15-16. 35-38 scales. Tr 11-12. Gillrakers 2+1+5. Depth 4.5; head 3.6; pectoral 3.6; pelvic 5.5; caudal 4.3 in body. Eye 3.8-4.1 in head, 1.2 times snout. Head broad, body compressed, eyes adjacent. 5-6 vertical series of papillae below eye, 2 along cheek, several behind eye and

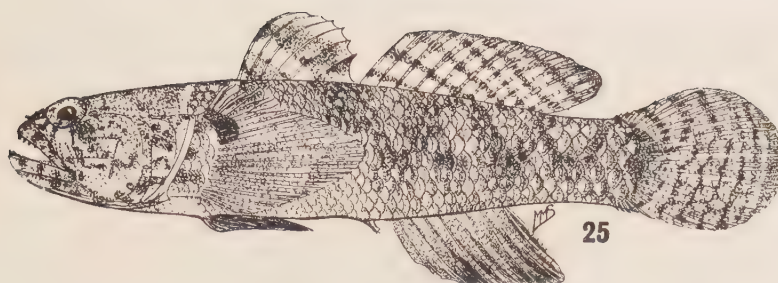


Fig. 25. *Monishia sordida* n. sp. Type, 45 mm.

several close before dorsal. Nostrils low tubes, anterior with tentacle behind. Gilloopening over pectoral base, front of 1st gill arch closed by membrane, rakers short. Maxilla below hind edge of eye, lower jaw projects, teeth in bands, outer larger, males with recurved canine on side of lower jaw. Several large retrorse teeth behind band in front of upper jaw. Tongue weakly bilobed. 1st dorsal spine longest, about $\frac{2}{3}$ body depth, soft rays subequal, hind end of fin to near caudal base, anal similar. Pectoral not to anal origin, upper rays silklike. Pelvics united, short of anus, fraenum feeble. Scales ctenoid, little smaller forwards, none before gilopening, where few cycloid. Belly fully scaly, also pectoral base, with cycloid scales, none prepelvic, nape and head naked. Live colour: brownish, irregularly speckled dark, fins mottled dusky, dark spot on upper part of pectoral base, pelvics dusky. Preserved, similar. Many specimens, 30-52 mm., from Inhaca to Malindi, mainly sheltered areas. The type, 45 mm., Inhaca. One, 42 mm., from Mocimboa (Moz.), apparently a male, indicates buccal incubation, for its mouth is full of eggs, similar to those found in a female. I suspect that this species has often been identified as *Bathygobius fuscus* Ruppell, because of silklike rays in pectoral and appearance. It is clearly distinguished from *william*, closely related more southerly form, by scales on mid belly and pectoral base, fewer scales, and the usually shorter hind dorsal and anal rays.

MONISHIA WILLIAM (Smith), 1947 (PI 13, F). Smith 1947, 341, f 2. Smith 1949b, 331, Pl 71, f 911. D VI+I 10-11. A I 8-9. P 8+13-14. 39-43 scales. Tr 12. Gillrakers 3+1+4-5. Depth 4.5; head 3.3 in body. Eye 4 in head, equals snout. Males with large canine at side. End of 2nd dorsal not to caudal base. Pelvic fraenum feeble in young, stronger with age. Scales ctenoid behind, become cycloid along dorsal and anal bases, and on side below 1st dorsal, none before pectoral axil. Nape, head and prepelvic area naked, side of belly with small cycloid scales, mid area of belly and pectoral base naked. Colour: highly variable, alive or dead; live, rather sombre colours: preserved, dusky, scale edges darker, dark halfmoon at caudal base prominent. Attains 50 mm. From Xora (33°S) to Inhaca, where rare.

27. *Cabillus* nov.

Genotype *Cabillus lacertops* n. sp. Head depressed, eyes dorsal, adjacent. Large ctenoid scales, none on nape or head. Teeth in bands, outer enlarged. Palate edentate. Tongue bilobed. Gilloopenings over pectoral base only. No P. silklike rays. Pelvics basally united, no fraenum. Caudal shorter than head.

Cabillus lacertops n. sp.

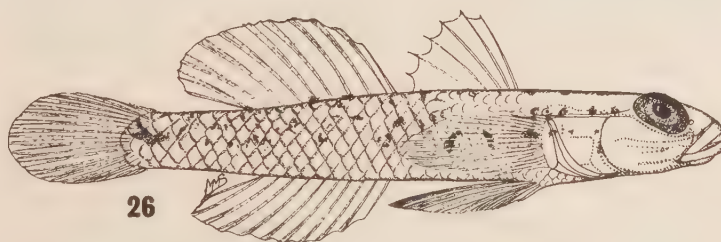


Fig. 26. *Cabillus lacertops* n. sp. Type, 35 mm.

D VI+I 9. A I 9. P 17. Scales 28. Tr 8. Gillrakers 2+1+6. Depth 6.2; head 3.4; pectoral 4; pelvic 3.6; caudal 4 in body. Eye 3 in head, 1.6 times snout. Head strongly depressed, eyes adjacent. 2-3 rows of papillae along mid cheek. Front nostril a low tube over lip, hinder a pore before eye. Gilloopening not exceeds pectoral base. Rakers small. Mouth moderate, maxilla to below front of pupil, lower jaw projects. Fine teeth in narrow bands; in upper jaw outer series enlarged to hind end, in lower 10 larger teeth across front of jaw, hindmost recurved, larger. Tongue bilobed. 2nd and 3rd dorsal spines longest, equal body depth, soft rays slightly longer, anal similar. Pectoral near anal origin. Pelvics united basally, no fraenum, to anal origin. Scales ctenoid, few smaller below front of 1st dorsal cycloid, none before hind edge opercle. Belly and prepelvic scales cycloid, none on pectoral base, nape or head. Live colour: yellowish, with odd brown speckles, most prominent a few on shoulder, pectoral base, the largest at caudal base. One, 35 mm. length, from Pinda, the type.

28. **Fusigobius** Whitley, 1930.

Genotype **Gobius neophytus** Gunther, 1877. Head and body compressed. 22-24 ctenoid scales, mid nape and head naked, one scale at times on opercle. Teeth in bands, outer enlarged, mouth horizontal. Palate edentate. Tongue rounded. Gillopening little exceeds pectoral base, front fourth of outer arch closed by membrane. No pelvic fraenum. Caudal equals head. The Pacific genotype and an African subspecies.

FUSIGOBIUS NEOPHYTUS (Gunther), 1877. Koumans 1953, 146, f 35.

Fusigobius neophytus africanus n. subsp. (Pl 11, F).

D VI+I 9. A I 8. P 1, 16-17. Scales 24-25. Tr 7. Predorsal 5. Gillrakers 3+1+6-7. Depth 4.5; head 3.4; pectoral 3.3; pelvic 4; caudal 4.5 in body. Eye 4 in head, equals snout. Eyes adjacent, erectile above profile. Two lines of papillae along cheek. Nostrils close together, front a small tube, hinder a pore. Gill-opening little below pectoral base, rakers short. Mouth horizontal, maxilla below front of eye. Fine teeth in moderate band in each jaw, front series larger, small recurved canines on side lower jaw. Tongue rounded. 1st dorsal spine longest, hinder shorter, last dorsal and anal rays in males to near caudal base. Pectoral beyond anal origin, upper ray simple. Pelvics feebly united, to anal origin. Caudal little rounded. Large ctenoid scales which on side of head reach hind margin eyes, front 3 series cycloid, median predorsal naked, often low median ridge. 3 large cycloid scales over exposed part of P base, prepelvic scales cycloid. Head naked, except a cycloid scale (or empty pocket) on upper front corner of opercle in most cases. Colour: variable, mainly as in Pl 11, F, or with only fine orange spots, some with a row of striped black ocelli along hind edge of 1st dorsal. Preserved: yellowish, with dark spots along body, most marked are one at caudal base, and often one on peduncle. Odd lines of spots on head. Many specimens, 18-72 mm. length, from Bazaruto, Pinda, Zanzibar, Shimoni, Aldabra, and Mahé. The type, 62 mm., from Ibo. **neophytus** Gunther, is recorded only from the Pacific, this discovery in the W. Indian Ocean is noteworthy. My specimens are constantly different from descriptions of **neophytus** in having longer hinder dorsal and anal rays, and canines in the lower jaw in adults, also in presence of a scale on opercle.

29. **Palutrus nov.**

Genotype **P. reticularis n.sp.** Head and body little compressed. Moderate ctenoid scales, cycloid predorsal, not to eyes, head naked. Teeth in narrow bands, outer little enlarged. Palate edentate. Tongue rounded — truncate. Gillopening only over pectoral base. Pelvics barely united, no fraenum. Caudal equals head. Related to **Quisquilius** J & E, differs in scaling not to eyes and smaller gill opening, from **Acentrogobius** Blkr., in barely united pelvics without fraenum, and from **Monishia** in lacking silklike rays in pectoral. **Quisquilius macrophthalmus** Weber, 1909 may fall here.

Palutrus reticularis n.sp.

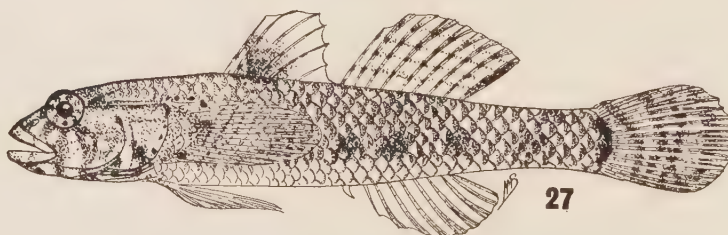


Fig. 27. **Palutrus reticularis n.sp.** Type, 22 mm.

D VI+I 8. A I 7. P 14-15. 30 scales. Tr 9-10. Predorsal 12. Gillrakers 3+1+7. Depth 5; head 3.7; pectoral 4.2; pelvic 4.4; caudal 4.4 in body. Eye 4 in head, equals snout. Eyes adjacent. No papillae visible on cheeks. Front nostril a low tube near lip, hinder a pore close before eye. Gillopening barely exceeds pectoral base, rakers short, stout. Mouth small, slightly oblique, maxilla to below front of pupil, lower jaw shorter, teeth in narrow bands in each jaw, outer little enlarged. Tongue rounded. 2nd and 3rd dorsal spines longest, four-fifths body depth, soft rays little higher. Anal similar. Pectoral almost to anus, no silklike rays. Pelvics barely united basally, no fraenum, not to vent. Caudal rounded, less than head. Ctenoid scales, become cycloid on shoulder and nape, also on pectoral base, belly and prepelvic, most of latter area naked, a few embedded scales before pelvic base. Predorsal scales almost to eyes, small, embedded. Head naked. Colour, yellowish, margins of scales darker forming reticulate pattern. 1st dorsal dusky medially, a dark mark on opercle and one below eye, 3-4 black spots above pectoral, 2nd dorsal barred, caudal with broad crossbars. The type, 22 mm., from Pinda, one, 23 mm., from Mahé (Seych.).

30. **Zonogobius** Bleeker, 1874.

Genotype **Gobius semidoliatus** Val., 1837. Head wide, body little compressed. 23-30 ctenoid scales, nape and head naked. Teeth in bands, outer enlarged, canines. Palate edentate. Gillopening wide. Pelvics united basally, no fraenum. Caudal less than head.

- A. 7 anal rays. Crossbars on head **semidoliatus**
 B. 8-10 anal rays. Spots on head :
 a. 23-26 scales **flammeus n. sp.**
 b. 30 scales **corallinus n. sp.**



Fig. 28. *Zonogobius semidoliatus* (Val.), 20 mm.

ZONOGOBIOUS SEMIDOLIATUS (Valenciennes), 1837. **Gobius semidoliatus** Klunzinger 1870, 475. Gunther 1877, 174, Pl 109, f 4. Day 1878, 295, Pl 59, f 6. Hemprich & Ehrenberg 1899, Pl 9, f 8 (All Red Sea). Pellegrin 1904, 11 (Somaliland). D VI+I 9. A I 7. P 17. Scales 25. Tr 10. Gillrakers 2+1+9. Depth 3.7; head 3.1 in body. Eye 3 in head, twice snout. Head and body compressed. Gillopening far forward, rakers moderate, spiny. Mouth moderate, oblique, maxilla below front of eye, lower jaw prominent, small teeth in bands, a few in front enlarged. Tongue truncate. 2nd dorsal spine longest, about equals body depth. Pectoral to anal origin, pelvics almost to anus. Scales mostly lost, no pockets before hind opercle margin, nape, head, pectoral base and chest naked. Colour: in life, brownish-red with light cross bars as shown, head and body minutely speckled brown. One specimen, 20 mm. length, Pinda. Known from Red Sea to Pacific, obviously rare in the W. Indian Ocean.

***Zonogobius flammeus* n. sp. (Pl 10, G).**

D VI+I 9-10. A I 8-10. P 17. Scales 23-26. Tr 8-9. Gillrakers 3+1+11-12. Depth 3.8; head 3.6; pectoral equals pelvic 4; caudal 3.9 in body. Eye 3 in head, twice snout. Head and body compressed, eyes adjacent. A papillate ridge down over maxilla end, one below eye and one across cheek. Front nostril a small tube above lip, hinder a pore midway to eye. Gillopening far forward, rakers moderate. Mouth oblique, lower jaw projects, maxilla to below front of eye. Fine teeth in bands in each jaw, in lower on each side 3 larger teeth, outer caniniform, in upper 3 larger teeth in front, some also along side of jaw, some inner teeth enlarged. Tongue almost truncate. In males 2nd and 3rd dorsal spines filiform, almost twice head, soft fin lower, $\frac{1}{2}$ body depth, anal similar. Pectoral and pelvic almost to anal origin. Pelvics barely united, no fraenum. Caudal rounded. Scales mostly ctenoid, those on front of belly, chest and pectoral base cycloid. No scales on nape or head. Colour: as shown in Pl 10; preserved, almost uniform yellow with remains of spots. Many specimens, 20-25 mm. length, from Delagoa Bay, Pinda, Wamizi, Assumption Is., and Shimoni, the type, 25 mm., Pinda. Exquisite small fish.

***Zonogobius corallinus* n. sp.**

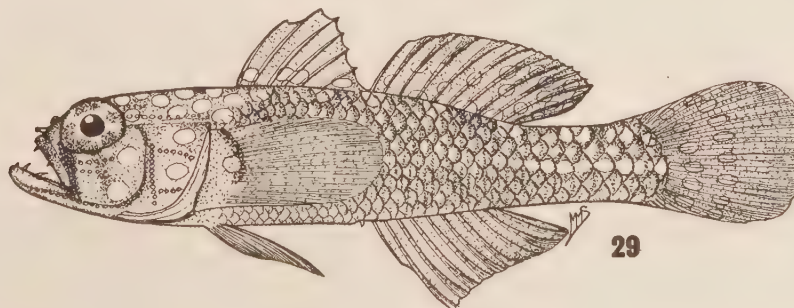


Fig. 29. *Zonogobius corallinus* n. sp. Type, 24 mm.

D VI+I 10. A I 9. P 19. Scales 30. Tr 10-11. Gillrakers 3+1+10. Depth 4.3; head 3.3; pectoral 4.2; pelvic 4.7; caudal 4.4 in body. Eye 2.5 in head, 3 times snout. Head and body compressed, eyes adjacent. A line of papillae over premaxilla, two along below eye, one down front of opercle, a line back behind eye. Nostrils tubular, anterior over lip, narrow, with flap behind, hinder wider and shorter, close before eye.

Interorbital a deep groove, continues behind eyes. Gilloopening far forward, rakers slender. Mouth sub-vertical, maxilla below front of eye, teeth in narrow bands in each jaw, in upper a canine each side in front, larger teeth on side, in lower front teeth larger, a larger canine each side, one behind recurved. Tongue pointed. 2nd and 3rd dorsal spines longest, about $\frac{2}{3}$ body depth, last spine joined to 2nd fin, hind soft rays equal longest spines, anal rays longer. Pectoral ends at anal origin. Pelvics united basally, no fraenum, almost to vent. Scales ctenoid behind, become cycloid below 1st dorsal, end at pectoral axil, none along base of front part of 1st dorsal, nape, head, pectoral base and chest naked. Live colour: body red with two silvery areas on back below 1st, and 3 below 2nd dorsal. Dull pupil-sized orange spots on head, and on peduncle. 1st dorsal with red spines, membrane pink, soft rays red, membrane pale with orange spots, 3 large orange spots along base. Anal membrane pink, rays red. Caudal spines pink, 2-3 rows of orange spots across rays at base. Pectoral light with orange spot on base, pelvic rays bright salmon. Preserved, uniform. Only the type, 24 mm., Baixo Pinda, Moz.

31. *Quisquilius* Jordan & Evermann, 1902.

Genotype *Q. eugenius* J & E, 1902. Head broad, body little compressed. 24-35 ctenoid scales, nape scaly, sometimes on opercle. Teeth in bands, outer enlarged, canines. Palate edentate. Tongue truncate. Gilloopenings wide, forward. Pelvics united basally, no fraenum. Caudal less than head. Species distinguished largely by markings.

- A. Broad light bars across head and body *eugenius*
- B. Narrow lines only on head :
 - I. Edges of scales dark, form pattern *inhaca*
 - II. Each scale with red spot *anthioides* n. sp.

QUISQUILIUS EUGENIUS Jordan & Evermann, 1902 (Pl 12, D). *Heteroleotris eugenius* Smith 1949b, 507, Pl 101, f 935a. Fourmanoir, 1954, 206. D VI+I 10-11. A I 8-9. Scales 30-34. Tr 10. Predorsal 15-16. Gill-rakers 3+1+9-11. Red, orange, brown or greenish brown with light crossbars. To 50 mm. Inhaca, East Africa to mid Pacific, not rare.

QUISQUILIUS INHACA (Smith), 1949 (Pl 12, F). *Gobius inhaca* Smith 1949a, 103, and 1949b, 507, f 923a. D VI+I 10-11. A I 8. Scales 27-28. Tr 14. Predorsal 15-16. Brick red, edges of scales darker, lines as in Pl 12. Attains 40 mm. Inhaca to Shimoni.

Quisquilius anthioides n. sp. (Pl 10, F).

D VI+I 10. A I 8. P 17. Scales 32. Tr 11. Predorsal 18. Gillrakers 4+1+10. Depth 4; head 4; pectoral 3.7; pelvic 3.8 in body. Eye 3.5 in head, 1.5 times snout, 2.5 times interorbital. Head and body moderately compressed, nape convex. Several lines of papillae down across cheek. Front nostril a short tube over lip, hinder a pore close to eye. Gilloopening wide, rakers short. Mouth moderate, oblique, maxilla to front of pupil. A band of fine teeth in each jaw, in upper, outer series enlarged, recurved, caniniform, in lower, 10 large teeth across front of jaw, hinder strongly recurved, caniniform, also a small series inside band. Tongue truncate. 2-4th dorsal spines longest, $\frac{1}{2}$ body depth, soft rays longer behind, anal similar. Pectoral to just beyond anal origin. Pelvics united basally, no fraenum, to anus. Caudal rounded. All scales ctenoid, also on pectoral base and prepelvic, nape scaly to between eyes. A few scales on upper part of opercle, encroach on preopercle, rest of head naked. Colour: vivid as shown in Pl 10. One, 39 mm., the type, Zanzibar, found in an orange sponge from 8 fathoms. Resembles *Q. inhaca* (Smith), differs in colouration.

32. *Coryphopterus* Gill, 1863.

Genotype *C. glaucofraenum* Gill, 1863. Head depressed, body little compressed. 30-65 scales, ctenoid or cycloid, or both, no scales before 1st dorsal. Teeth in bands, outer enlarged. Palate edentate. Gilloopenings little exceed P base. Pelvic fraenum strong. No silklike P rays. Caudal rounded, short. A doubtful "catch-all" genus. 2 species in our area, easily distinguished.

Coryphopterus dubius n. sp.



Fig. 30. *Coryphopterus dubius* n. sp. Type, 35 mm.

D VI+I 13. A I 11. P 20. 60-65 scales. Tr about 20. Gillrakers 3+1+7. Depth 5.6; head 3.2; pectoral 4; pelvic 5; caudal 4.5 in body. Eye 4 in head, equals snout. Head depressed, body little com-



PLATE 11

A. *Acentrogobius bellissimus* n. sp. Type, 127 mm. B. *Oplopomus oplopomus* (Val), 62 mm. C. & D. *Acentrogobius cauerensis* (Blkr). C, 59 mm. D, var. 50 mm. E. *Silhouettea insinuans* n. sp. Type, 44 mm. F. *Fusigobius neophytus africanus* n. subsp. Type, 64 mm. G. *Amblygobius sphynx* (Val.) 110 mm. H. *Gnatholepis baliurus* (Val). 71 mm. I. *Bathygobius fuscus* (Rupp). 56 mm. J. *Gladiogobius ensifer* Herre, 46 mm. K. *Ctenogobiops crocineus* n. sp. Type, 50 mm. L. *Acentrogobius neilli* (Day). 52 mm.

pressed. Eyes adjacent. Some lines of pores down from eye. Front nostril a small tube over lip, hinder a pore before eye. Gilloopening little exceeds pectoral base, rakers short points. Mouth small, maxilla to below front of pupil, teeth in narrow bands, outer enlarged. Tongue rounded. 1st dorsal low, barely half body depth, rays little longer, not to caudal base. Anal similar. Pectoral not to anus, pelvics cup-shaped, strong fraenum, with small free lobe each side. Caudal rounded. Scales small, largest on peduncle, ctenoid to below 1st dorsal, those in front cycloid, smaller. No scales before 1st dorsal origin to pectoral axil, mid-line of belly, prepelvic, pectoral base, whole of nape and head naked. Colour: yellowish, densely covered with fine dark specks, a dark mark before pectoral axil, otherwise as shown in fig. 30. The type, 35 mm. length, from Mahé, Seychelles, in this Department.

CORYPHOPTERUS OCHETICUS Norman, 1927 (**PI 13, H**). Norman 1927, 378 & 381, fs 92, 93. Chabanaud 1934, 160 (Suez). Not seen. D VI+I 10-11. A I 9-10. 30 scales. Tr 8. Scales cycloid, none predorsal. Pale, marked as shown. To 62 mm. Gulf of Suez.

33. Genus **Abranches** Smith, 1947.

Genotype **A. pinto** Smith, 1947. Broad depressed head, with skinny ciliate flaps, a mental flap and cilia. Body little compressed. Minute cycloid scales to shoulder, a few predorsal, head naked. Teeth in bands, outer enlarged. Palate edentate. Tongue rounded. Gilloopening little below P. base. Pelvic fraenum strong, a lobe each side. Caudal less than head. Only the type.

ABRANCHES PINTO Smith, 1947 (**PI 12, I**). Smith 1947, 813; and 1949b, 331, f 909. D VI+I 10. A I 9. Scales 50. Tr 20. 1+1+9 gillrakers. Nostrils tubular. Brownish, with dark markings as shown, resembles a Batrachid fish. Attains 65 mm. Muddy areas, Delagoa Bay.

34. **Drombus** Jordan & Seale, 1905.

Genotype **D. palackyi** J & S, 1905. Head broad, body little compressed. Raised flaps of papillae on head. 20-40 ctenoid scales, nape and opercle scaly. Teeth in bands, outer little larger. Palate edentate. Tongue truncate. Gilloopening barely exceeds pectoral base. Pelvic fraenum strong. Caudal equals head or longer. Differs from **Callogobius** Blkr., 1874 in pelvics fully united, with strong fraenum. 2 species in our area.

A. 25-27 scales. Spotted	irrasus n. sp.
B. 30-33 scales. Boldly barred	plumatus n. sp.

Drombus irrasus n. sp. (PI 10, E).



Fig. 31. **Drombus irrasus n. sp.** Type, 49 mm.

D VI+I 9. A I 6-7. P 18-19. Scales 25-27. Tr 8. Predorsal 6-7. Gillrakers 2-3+1+8. Depth 4; head 3.3; pectoral 3.3; pelvic 3.7; caudal 3.3 in body. Eye 3.6 in head, equals snout, 3 times interorbital. Head depressed, body compressed. Head with many papillate ridges, a few on scales of shoulder, 2 predorsal on nape. Nostrils tubular, front almost $\frac{1}{2}$ eye, over lip, hinder smaller, close behind. Gilloopening restricted, rakers moderate, upper feeble, longest in angle about $\frac{1}{4}$ eye, shorter in front. Mouth small, oblique, maxilla to below hind nostril, lower jaw projects, in each jaw broad band of fine teeth, outer series little larger, in lower jaw innermost also. Tongue truncate or emarginate. 1st and 2nd dorsal spines elongate in males, up to $1\frac{1}{2}$ times body depth, 1st longest, remainder shorten to last. Hind end of dorsal and anal pointed, dorsal rays subequal, 2nd last anal ray equals body depth, 1.3 times front dorsal ray. Anal wholly below dorsal. Pectoral rays all divided, tip to above 2-3rd anal ray. Pelvic fraenum strong, a cycloid scale median within the cup. Caudal rounded, equals head. Whole body scaly, mostly ctenoid, cycloid before dorsal origin, on pectoral base, belly, chest, nape and head. Beneath skin on cheek and opercle 4 series of concealed cycloid scales. Lobate scales along base of dorsal and anal, scales over base of pectoral rays. Live colour, as shown in Pl 10, or sooty; preserved; yellowish, some ridges on head, and hind nostril dusky, most fins dark, dorsal, caudal, anal and pectoral with light spots. Many specimens, 25-68 mm. length, Bazaruto north along E. Africa, at Zanzibar, Pemba and all islands to Seychelles, mainly below low tide from coral by explosives. The type from Conant Reef, Mahé (Seych.), 49 mm. length. The front nasal tube is short in a

few specimens, otherwise similar. Closely related to and resembles **Drombus maculipinnis** Fowler, 1918 known from one 50 mm. specimen from Philippines. **maculipinnis** has 1st dorsal of different shape, and said to have pelvics united only in basal half, so the African form at present kept distinct.

Drombus plumatus n. sp.



Fig. 32. **Drombus plumatus n. sp.** Type, 50 mm.

D VI+I 9. A I 6-7. P 19-20. Scales 30-33. Tr 9. Predorsal 9-11. Gillrakers 0+1+7. Depth 4; head 3.7; pectoral 3.0; pelvic 4; caudal 2.8 in body. Eye 4 in head, 1.1 in snout, 4 times interorbital. Head depressed, body compressed. Many papillate ridges on head, most dark coloured, 2 predorsal on nape. Nostrils tubular, front wide and short, close above lip, hinder longer and slender, midway between lip and eye, both on raised area. Gillopening barely continued below, front 3rd of 1st gillslit closed by membrane, rakers moderate, some rudiments on upper limb. Mouth small, oblique, lower jaw projects, maxilla to below hind nostril. In both jaws fine teeth in bands, outer series slightly larger. Tongue truncate or emarginate, fine papillae on palate and tongue. 3rd and 4th dorsal spines highest, $\frac{3}{4}$ body depth, membrane to base of 2nd fin, mid soft rays highest, little exceed body depth, fin rounded. Anal wholly below dorsal, rays increase to 2nd last, about equals 4th dorsal spine, end of fin pointed. All pectoral rays divided, fin reaches 2-3rd anal ray. Pelvic rays apically multifid, bent outwards, apex near vent. Caudal 1.3 times head. Scales ctenoid, little larger on peduncle, smaller in front, cycloid on belly, breast, pectoral base, nape and head. 3 series of concealed scales on opercle, 2-3 on cheek between papillae. Colour: milky yellow, with bold brown-black markings as in Fig. 32. Light spots on caudal and hind lobe of anal. 6 specimens, 28-50 mm. length, from Pinda, Cape Delgado, Zanzibar, Malindi and Cosmoledo, the type, 50 mm., Cape Delgado. Taken by explosives in deepish water. A handsome small fish.

35. **Bathygobius** Bleeker, 1878.

Genotype **Gobius nebulopunctatus** Val., 1837 = **fuscus** Rupp., 1828. Head depressed, body little compressed. 30-45 ctenoid scales, nape scaly, sometimes opercles. Teeth in bands, outer enlarged, sometimes canines. Palate edentate. Tongue bilobed. Gillopening little exceeds pectoral base. D2 I 8-11. A I 7-9. Upper pectoral rays silk-like. Pelvics form disc, fraenum strong. Caudal less than head. Few species. 2 in our area.

A. Head naked **fuscus**
B. Head scaly **petrophilus**

BATHYGOBIUS FUSCUS Ruppell, 1828 (Pl 11, I). Recorded over whole W. Indian Ocean as **Gobius** or **Bathygobius fuscus** (**albopunctatus** Val., 1837 : **nebulopunctatus** Val., 1837 : **soporator** Val., 1837 : **nigripinnis** Guichenot, 1863 : **punctillatus** Blkr., 1879 : **coalitus** Bennett, 1831 : **obscurus** Peters, 1855). D VI+I (8-)-9. A I (7-)-8(-)9. P 18-20. Scales 38-44. Tr 11-13. Predorsal 18-25. Gillrakers 3+1+6-7. Front nostril a trumpet-shaped tubule, hinder a pore. Front third of 1st gillarch closed by membrane, rakers short. Pelvic fraenum with lobe each side. Predorsal scales almost to eyes, head naked. Colour variable, many as shown in Pl 11, some almost black. To 120 mm. One of the most successful species, abundant and widespread, from S. Africa to E. Pacific, probably more synonyms than any other fish. (Illustration Pl 11 shows in error D VII+I).

BATHYGOBIUS PETROPHILUS (Blkr.), 1853. Fourmanoir 1954, 206 (Comores). Not seen. D VI+I 8-10. A I 7-8. P 20. Scales 38. Tr 11-12. Predorsal 30. Depth 5, head $3\frac{1}{2}$ in body. Predorsal scaling to between eyes, scales on cheek and opercle. P and pelvic less than head. Reddish, mottled above. Fins dark, 1st D with 3-4 stripes, spots on 2nd D, P and caudal. To 95 mm. E. Indies and Pacific, one bare record from Comores, not otherwise found in W. Indian Ocean.

36. **Waitea** Jordan & Seale, 1905.

Genotype **Gobius mystacinus** Val., 1837. Head and body compressed. 30-50 ctenoid scales, a few scales before dorsal, nape otherwise and head naked. Teeth in bands, outer and inner larger. Tongue

rounded. Gilloping extends forward. 1st dorsal high in front. Pelvic fraenum strong. Caudal not exceeds head. 2 species, differ in scaling.

WAITEA MYSTACINA (Val.), 1837. **Gobius mystacinus** Smith & Koumans 1932, 256, Pl 23 (Dar es Sal.). D VI+I 10. A I 9. P 16-17. Scales 37. Tr 13-15. Predorsal 8. Head 3-3½, depth 4½ in length. Maxilla to or near preopercle margin. No canines. Head and nape naked, a few scales predorsal. Breast scaly. 8 transverse crossbars, head and shoulder spotted, 1st dorsal with bands and dark tip, 2nd fin spotted, pale marginal band on anal. To 80 mm. East Africa to W. Pacific.

WAITEA DUQUE (Smith), 1947 (PI 13, E). **Mahidolia duque** Smith 1947, 812; and 1949b, No. 907, Pl 72, f 907. D VI+I 10. A I 9. P 18. 50 scales. Tr 16. Predorsal 2-3. Gillrakers 4+1+13. Depth 4.5, head 2.8 in body. Eye 5 in head, 1.2 in snout, twice interorbital. Gilloping halfway to eye, rakers well developed. 1st D spine 1.8 times body depth. Small curved canines in front in each jaw. Scales ctenoid behind, become cycloid below 1st dorsal, none before gilloping, 2-3 isolated scales close predorsal, nape otherwise, pectoral base, and head naked. In life yellowish with brown bars, red spots on head. 1st dorsal slaty with 2 yellow lines, 2nd fin yellow with red lines, caudal yellow, anal brownish, with red lines, pectoral yellow, pelvic dusky. Known only from the type, 78 mm., Delagoa Bay. The scale count is clearly about 50 to gilloping, provisionally kept separate from **mystacina** Val.

37. **Gnatholepis** Bleeker, 1874.

Genotype **Gobius anjerensis** Bkr., 1850. Head and body moderately compressed. Large ctenoid scales, nape and opercles scaly. Teeth in bands, outer enlarged, canines. Palate edentate. Tongue rounded. D2 & A I 8-11. Gilloping wide. Pelvic fraenum strong. Caudal less than head. Pacific, not before found in Indian Ocean.

GNATHOLEPIS BALIURUS (Valenciennes), 1837 (PI 11, H). Koumans 1953, 169, f 41. D VI+I 10. A I 8-9. P 17. 28-30 scales. Tr 8. Predorsal 10-11. Gillrakers 3+1+12. Depth 4.8; head 3.7 in body. Eye 3.7 in head, equals snout. Head and body compressed. Eyes close together in dorsal profile. 1-2 papillate ridges along cheek between scale rows, numerous vertical series below eye. Nostrils equally spaced on snout, anterior a low tube, hinder an equal pore. Gilloping wide, to below eye, rakers moderate, longest before angle, upper feeble. Mouth large, oblique, maxilla below middle of eye, in upper jaw outer series of teeth larger, a fairly wide band of fine teeth, inner series larger, depressible. Lower jaw similar, no canines. Tongue rounded. 2nd dorsal spine longest, almost body depth, soft rays increase to 8-9th, almost body depth. Anal little behind dorsal, rays subequal. Pectoral to anal origin. Pelvic with deep fraenum, not to vent. Caudal rounded. Scales ctenoid on body, cycloid on nape, head, pectoral base and prepelvic. 3 series on opercle and 3 on cheek, whole nape scaly, single scale median between eyes. Live colour: as shown in Pl 11: as preserved; yellowish with darker markings as in Pl 11, prominent light half-moon on hind part of eye, 1st dorsal dusky apically, both fins finely speckled. 7 specimens, 60-88 mm. length, Nacala and Mombasa, hitherto known from East Indies and Pacific. My specimens indicate **calliurus** Jordan & Seale, 1905 from East Indies as not different.

38. **Cryptocentroides** Popta, 1922.

Genotype **Cryptocentroides dentatus** Popta, 1922 = **insignis** Seale, 1910. Compressed head and body. 60-75 ctenoid or cycloid scales, nape and head naked. Teeth in bands, outer enlarged, canines. Tongue rounded. Gilloping wide. D2 I 10-13. A I 9-13. Pelvics with marked fraenum. Caudal about equals head. Possibly 2 species in our area.

A. 9 anal rays. Barred	cryptocentrus
B. 11 anal rays. Mainly spotted	maculosus

CRYPTOCENTROIDES CRYPTOCENTRUS (Valenciennes), 1837 (PI 13, L). **Gobius cryptocentrus** Val., 1837, 83, f 346. **Cryptocentrus fasciatus** Ehrenberg 1899, Pl 9, f 5. D VI+I 10. A I 9. Figure shows about 65 scales, and body rosy with yellow bars; dorsals pink, spotted, other fins yellow. Known only from a painting by Ehrenberg, 4 inch type, Massuah, Red Sea.

CRYPTOCENTROIDES MACULOSUS Fourmanoir, 1955. Roux Esteve & Fourmanoir 1955, 201. Not seen. D VI+I 11. A I 11. P 19. Scales 60. Tr 22. Depth 5, head 3.5 in body. Eye 4.3 in head. Mouth oblique, canines in both jaws. Scales ctenoid. Front 3 dorsal rays long, 2nd twice body depth. In alcohol yellow rose, along side 3 series of brown violet rectangular spots, with a brownish spot between each pair, below a ventral series of 6 ocelli. On side of head 3 oblique brown violet mucous canals. 2 small spots on pectoral base. Fins light, pelvic and anal margin dark. The type, 72 mm., Red Sea (Fourmanoir).

39. **Silhouettea** nov.

Genotype **S. insiruans** n.sp. Head and front of body depressed, eyes dorsal. Embedded ctenoid scales, cycloid on side of nape, midnape and head naked. Teeth in bands, outer and inner in front larger. Palate edentate. Tongue truncate. Gilloping to below preopercle. Pelvic fraenum strong. Caudal less than head.

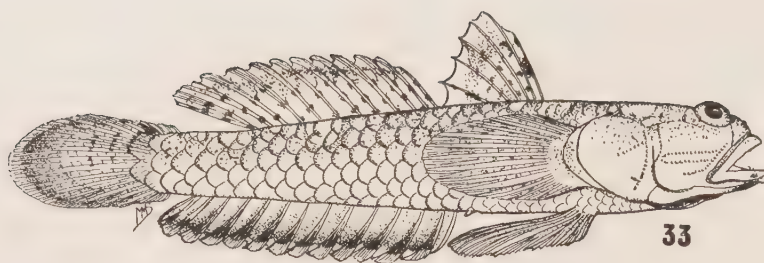


Fig. 33. *Silhouettea insinuans* n. sp. Type.

***Silhouettea insinuans* n. sp. (Pl 11, E).**

D VI+I 11-12. A I 13-14. P 1+11-12+2. Scales 27-29. Tr 8. Lateral predorsal 5-6. Gillrakers 2+1+8-9. Depth 5.5; head 3.3; pectoral equals pelvic, 4; caudal 4 in body. Eye 5 in head, equals snout. Head broad, depressed, body cylindrical, little compressed behind. Eyes below skin, adjacent, subdorsal, prominent, clearly erectile, pupil mostly hidden by black membrane, aperture small, ovoid. 2 parallel lines of papillae along cheek, another oblique in front, several on opercle. Front nostril low tube, near lip, hinder a pore close to eye. Sensory canal across behind eyes prominent, with several pores. Gilloopening to below preopercle edge, rakers low knobs. Mouth moderate, oblique, lower jaw projects little, maxilla reaches to middle or hind eye. Teeth in lower jaw varied, in front a single series of 4-5 finely curved teeth, behind this a narrow band of 2-3 series of minute sharp teeth and within this a series of larger separate teeth, those in front largest, in males a small recurved canine on side of jaw. Upper jaw teeth similar, but outer larger and inner small. Tongue truncate. 1st dorsal lower than body, 2nd and 3rd spines longer in males, membrane from 6th to base of 2nd fin, rays increase slightly, last few almost body depth. Anal exceeds dorsal, rays subequal, apically multifid, longest about half body depth. Pectoral 1.2-1.3 in head, well beyond anal origin, pelvic 1.2 in head, to 1st anal ray, fraenum strong. Caudal rounded, 1.2-1.3 in head. Scales feebly ctenoid, become cycloid below dorsal origin, extend on shoulder to above midopercle, midline of nape and behind eyes naked, head naked, also pectoral base and area behind pelvic base. A few cycloid scales prepelvic. Live colour: faint, as shown in Pl 11. As preserved; yellowish, faint brown spots along back. Dorsal, caudal, pectoral and pelvic spotted, especially basally, in many specimens mentum and branchiostegal membrane densely spotted black. Many specimens, 15-45 mm. in length, from Bazaruto, Pinda, Shimoni, Zanzibar, Aldabra, Mahé and Silhouette, the type, 44 mm. length, from Silhouette. This Goby was found living in sand (together with *Kraemeria samoensis* Stndr., 1906), some obtained by sieving, most by poison.

40. *Glossogobius* Gill, 1862.

Genotype *Gobius platycephalus* Rich, 1854. Head depressed, body little compressed. 25-40 ctenoid scales, nape and opercle scaly. Teeth in bands, outer and inner larger, canines. Palate edentate. Tongue bilobed. Gilloopening wide. D2 & A I 6-10. Pelvic fraenum strong. Caudal not more than head.

GLOSSOGOBIUS GIURIS (Ham-Buch), 1822 (Pl 9, C). Smith 1949b, 334, Pl 73, f 919. Numerous records from whole W. Indian Ocean as *Gobius giuris* (kokius Val., 1837. *grandidieri* Playfair, 1868, and numerous synonyms in other areas). D VI+I 8-9. A I 7-8. P 17-20. Scales 30-35. Tr 9-12. Predorsal 15-25. Gillrakers 2+1+7-8. Eyes $\frac{1}{2}$ -1 diameter apart. Nostrils forward on snout. 3-5 lines of papillae along cheek. Lower jaw projects strongly, front teeth strong canines in adults. Tongue deeply bilobed. Gillrakers feeble. Predorsal scaling not to eyes, scales on upper part of opercle. Variable in characters, colour and markings, usually dark, with spots on body and fins. Said to attain 500 mm. Over whole W. Indian Ocean, also in freshwater.

SPECIES OF UNCERTAIN SYSTEMATIC POSITION

GOBIUS FILOSUS Valenciennes, 1837 (Maurit.), copied by Gunther 1861, 28: Bleeker & Pollen 1875, 77: Sauvage 1873, 520. Not seen. D VI+I 9. A I 8. Head 4, depth 6 in total length. Head flattened, eyes 6 in head, a diameter apart, lower jaw projects, no canines. 2nd D spine twice body depth, caudal pointed, less than head, pectoral without silklike rays. Pelvic fraenum strong. Yellow brown, spotted darker. Series of brown dots along dorsals, some across caudal, anal margin white. To $4\frac{1}{2}$ inches. Mauritius. No information about scales, position doubtful.

GOBIUS KOSIERENSIS Klunzinger 1870, 474 (Red Sea). D VI+I 8. A I 8. P 16. 30 scales. Tr 7. Body cylindrical. Depth 8, head $4\frac{1}{4}$, caudal 7 in total length. Eye 4 in head. Gilloopening to below preopercle. Lower jaw projects, maxilla to beyond front of eye. Outer teeth enlarged in both jaws, no canines. Scales angular, ctenoid, cycloid on pectoral base, nape and head naked. Pelvic fraenum weak, no silklike P rays. Olive, with variable sized dark spots, the last large spot at caudal base. Pelvic and anal light, others with dark spots. 45 mm. Not seen, but for statement about gilopening would place this as *Acentrogobius reichei* Bleeker, but may fall in *Ctenogobius* Gill.

Addendum
***Oxyurichthys guibei* n. sp.**

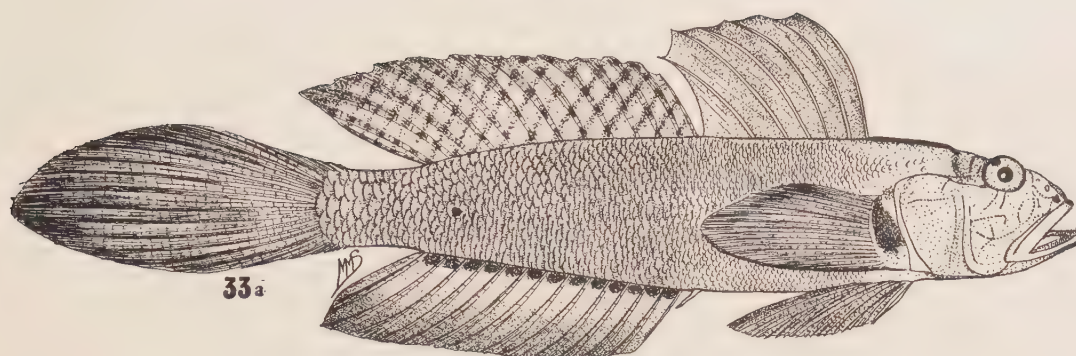


Fig. 33A. *Oxyurichthys guibei* n. sp. Type.

D VI+I 12. A I 13. P 18. About 70 scales. Tr 18. Gillrakers 2+1+3. Depth 5; head 4; pectoral 4; pelvic 4; caudal 2.3 in body. Eye 4 in head, 1.2 in snout, 4 times interorbital. Head and body compressed. Numerous irregular lines of papillae on cheek, one behind eye and several on opercle. A low crest median predorsal. Front nostril a short tube over upper lip, hinder a pore midway between snout tip and eye. Gillopening little exceeds pectoral base, lower rakers minute. Mouth large, maxilla to below pupil. One or two irregular large teeth behind single outer series in upper jaw. A band of fine teeth in lower jaw. Tongue pointed. Front 5 dorsal spines subequal, about body depth, soft rays shorter, increase behind. Anal similar. Pectoral to anal origin. Pelvic with deep fraenum, not to vent. Caudal 1.7 times head. Scales small, vertically elongate, ctenoid to front of 2nd dorsal, cycloid in front, scaling irregular. Midline and most of nape naked, also head and prepelvic, a few isolated scales on side of nape. Preserved brownish, front nostril, spot on eye and crest on nape, most of pectoral base and markings on fins black. The type, No. 988, 130 mm., from Mauritius. Kindly sent from Paris by Professor J. Guibe, reputedly as a co-type of *Gobius filus* Val. The type again in the Natural History Museum, Paris. It is related to *papuensis* Val., 1837, but clearly differs in fewer scales, sides of nape and prepelvic area naked.

(There has clearly been some confusion of specimens in Paris, see *Gobius filus* p 214).

FRESHWATER SPECIES

- Gobius isognathus*** Bleeker, 1867. Madag. Reunion.
- Gobius jayakari*** Boulenger, 1887. N. Arabia.
- Gobius macrorhynchus*** Bleeker, 1867. Madag. Reunion.
- Gobius madagascariensis*** Bleeker, 1867. Madag. Reunion.
- Gobius maindroni*** Sauvage, 1880. Maurit.
- Gobius sambiranoensis*** Bleeker, 1867. Madag. Reunion.

RECORDS AND SPECIES OF UNCERTAIN IDENTITY

- Gobius caeruleus*** Lacepede, 1798. Bourbon. Rec. by Sauvage 1875, 357.
- Gobius commersonii*** Val., 1837. Maurit. Reunion. Rec. by Blkr. & Pollen 1875, 77 : Sauvage 1875, 520.
- Gobius frenatus*** Gunther 1861, 39 (Australia). Rec. Madag. by Sauvage 1875, 366.
- Gobius lesueurii*** Risso, 1810 (Medit. Sea). Rec. Suez by Chabanaud 1933, 9.
- Gobius leucomelas*** (Hemprich & Ehrenberg) Peters, 1868. Red Sea. Possibly *Oplopomus caninoides* Blkr.
- Gobius louvali*** Petit, 1936. Madag.
- Gobius pallidus*** Val., 1837. Rec. from Mauritius by Blkr. & Pollen 1875, 77 : and Sauvage, 1875, 520 : from Eritrea by Borsieri 1904, 206.
- Gobius lienardi*** Bleeker, 1875 (= *coeruleus* Lienard, 1839, Mauritius).
- Gobius niger*** Lac., 1798. (Medit. & Atl.). Rec. from Reunion & Maurit. by Blkr. 1879, 17. From Suez by Tortonese 1948, 284.

Rhinogobius viridipunctatus (non Val., 1837). Rec. by Fowler 1935, 50, from Dar Es Salaam : not that species. Subfamily Sicydiaphiinae

Elongate body, naked or scaly. 2 dorsal fins. Pelvics united, free or adnate to belly, fraenum with fleshy lobes. In lower jaw a single row of simple teeth, sometimes labial teeth. All tropical seas.

- A. Pelvics adnate to belly 41. ***Sicyopterus***
- B. Pelvics not adnate to belly :
 - I. Front part of body and head naked 42. ***Bryaninops* nov.**
 - II. Whole body scaly :
 - a. Nape quite naked 43. ***Pleurosicyops* nov.**
 - b. Scales on nape :

1. Gillopinings restricted, 1st slit closed by membrane, no outer rakers 44. **Luposicya nov.**
 2. Gillopinings wide, 1st slit normal, rakers present 45. **Pleurosicya**
41. **Sicyopterus** Gill, 1860.

Genotype **S. stimpsoni** Gill, 1860. Elongate body, little compressed, with 50-80 ctenoid scales, cycloid in front, nape scaly, head naked. One series of teeth in upper jaw. Slender teeth in lower lip, in jaw 2 canines in front, and a row of wide-set teeth. 2 dorsal fins. Pelvics short, form disc, attached to belly, rays multifid. Freshwaters, breed in sea. Species poorly known, need revision.

A. Movable teeth in upper jaw tricuspid:

- I. Nape naked **acutipinnis**
- II. Nape and belly scaly **lagocephalus**
- III. Nape scaly, belly naked **parvipinnis**

B. All teeth simple **fasciatus**

SICYOPTERUS ACUTIPINNIS (Guichenot), 1863. **Cotylopus acutipinnis** Guichenot 1863, 10. Bleeker & Pollen 1875, 78. Sauvage 1875, 520, Pl 46, f 4. **Sicydium acutipinnis** Boulenger 1916, 44. Pellegrin 1933, 150, Pl 11, f 2. Not seen. D VI+I 10. A I 10. Scales 70, few predorsal, nape naked. Depth 6, head 4.7 in body. Pectoral equals head. Brown. 90 mm. Reunion.

SICYOPTERUS LAGOCEPHALUS (Pallas), 1774. Boulenger 1916, 44, f 26. As **Sicydium lagocephalus** and **S. laticeps** Val., 1837 numerous records from Mauritius and Reunion. Not seen. D VI+I 10-11. A I 10. 60-65 scales. Nape and belly scaly. Depth 5, head 4.5 in body. Pectoral equals head. Brown. 110 mm. Reunion, Mauritius.

SICYOPTERUS PARVIPINNIS (Guichenot), 1863. **Cotylopus parvipinnis** Guichenot 1863, 11, 27. Blkr. & Pollen 1875, 78. Sauvage 1875, 520, Pl 47, f 3. **Sicydium parvipinnis** Boulenger 1916, 45. Not seen. D VI-VII+I 10. A I 10. About 65 scales. Nape scaly, belly naked. Pectoral equals head. Yellow, scale borders darker, dark spot on 1st dorsal. 110 mm. Reunion.

SICYOPTERUS FASCIATUS (Day), 1878 (Pl 13, K). **Sicydium fasciatum** Day 1878, 299, Pl 64, f 7. Pellegrin 1933, 153, Pl 11, f 5 (Mad.). Not seen. D VI+I 10. A I 10. P 17. Scales 67. Tr 19. Predorsal 30. Depth 4.8, head 4.6 in body. Nape scaly, head naked. Scales cycloid in front. Brown, 6 vague crossbars, fins dark with light edge. 60 mm. Burma and Madagascar.

42. **Bryaninops nov.**

Genotype **Bryaninops ridens n.sp.** Eyes adjacent. Pelvics cupshaped, not adnate. Mouth terminal. Fine labial teeth present in lower jaw, a pair of canines in front. Larger teeth simple. 1st gillslit closed by membrane. Scales ctenoid, only on tail and part of flank. Caudal less than head. Related to **Bryanina** Fowler, 1932, one species **B. inana** Fwlr. (B.P.Bish.Mus.Occ.Pap. 1932, IX, 10, f 5), from Polynesia, Pacific, **ridens** differs in eyes adjacent, different shape of head and caudal, the latter less than head. Fowler states of **B. inana** "caudal longer than head" and "caudal $1\frac{1}{2}$ times head," but his fig. shows caudal 1.4 in head.

Bryaninops ridens n.sp. (Pl 12, H, pelvics)

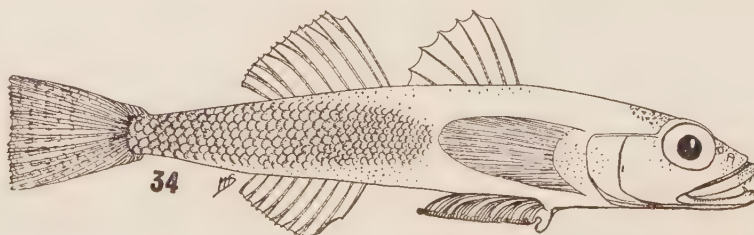


Fig. 34. **Bryaninops ridens n.sp.** Type.

D VI+I 8. A I 8. P 15. Scales 35. Tr max 8. Depth 5, head 3.2, pectoral 4.6, pelvic 4.6 in body. Caudal 1.3 in head. Eye 3 in head, 1.2 times snout. Head depressed, body little compressed, eyes adjacent. No papillae visible on head. Front nostril tubular, midway on snout, hinder a pore close before eye. Gill-opening to below preopercle margin, 1st arch closed by membrane, no true outer rakers. Mouth large, maxilla to below mid eye, in lower jaw fine labial teeth on side, a row of fine teeth along jaw, a pair of close set recurved canines in front. In upper jaw 1-2 series fine teeth and 4-5 larger recurved teeth each side in front. Palate edentate. Tongue adnate, bilobed. 2nd dorsal spine longest, $\frac{2}{3}$ body depth, 1st soft ray slightly higher, rays shorten behind. Anal similar but lower. Pectoral and pelvic not to anus, pelvic markedly cup-shaped, outer edge curves out, fraenum with one median and 2 lateral processes. Scaling confined to peduncle and hind part of flank, most of body naked, also head. Scales finely ctenoid, smaller anteriorly, about 35 to end of pectoral. Alive: translucent, with fine dark speckles on head, pectoral base, back and head. Preserved: yellowish, with faint speckles. 3 specimens, 18-20 mm., Baixo Pinda (Moz.), the type, 20 mm.

43. *Pleurosicyops* nov.

Genotype *Pleurosicyops timidus* n.sp. Elongate body with large ctenoid scales, none on nape, chest or head. Minute labial teeth in side of lower jaw, a pair of canines in front. Pelvics form cup, not adnate. Gillopinings restricted, 1st gill slit closed by membrane. Eyes adjacent. Differs from *Pleurosicya* Weber, 1913 from New Guinea, in horizontal mouth, absence of scales in advance of gillopinings, and in nature of gillopinings.

Pleurosicyops timidus n.sp.

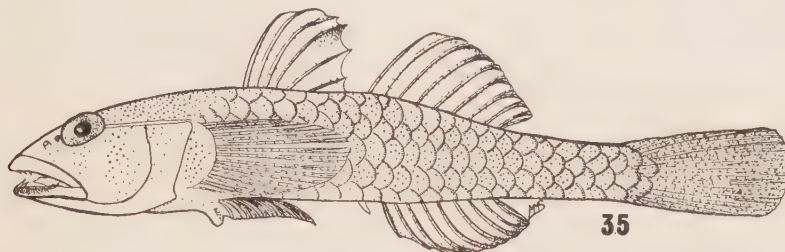


Fig. 35. *Pleurosicyops timidus* n.sp. Type.

D VI+I 8. A I 8. P 17. Scales 23-25. Tr 6-7. Depth 5.5; head 3.5; pectoral 4.2; pelvic 5.2; caudal 4 in body. Eye 3.8 in head, 1.1 in snout. Head moderately depressed, eyes adjacent. No pores visible on head. Front nostril tubular, midway on snout, hinder a pore close before eye. Gillopinings barely to below preopercle margin, 1st arch completely closed by membrane, no normal rakers. Mouth moderate, upper lip thick, maxilla to below middle of eye, in lower jaw minute setiform labial teeth, a single series of small teeth on side, in front 2-3 canines. Upper jaw with narrow band of fine teeth, 3-4 enlarged recurved teeth each side in front, smaller straight teeth outside on side of jaw. Palate edentate. Tongue bluntly pointed. 2nd and 3rd dorsal spines longest, almost body depth, 1st soft ray equals body depth, hinder rays shorter. Anal similar, but rays lower. Pectoral to anus, pelvic cupshaped, not to anus, fraenum with 2 large adjacent fleshy processes. Caudal rounded. Scales ctenoid barely smaller anteriorly, none midpredorsal, none beyond gillopinings. Nape, head, pectoral base, chest and front of belly naked. Alive, translucent, preserved, yellowish, with fine dark specks, tips of vertical fins dusky. 2 specimens, 22 and 23 mm., Baixo Pinda (Moz.), the former the type.

44. *Luposicya* nov.

Genotype *Luposicya lupus* n.sp. Elongate body with ctenoid scales to nape, chest and head naked. Eyes adjacent. Mouth large, terminal, upper lip expanded, spatulate. Strong labial teeth in lower jaw, a pair of canines in front, 1-2 on side. Recurved teeth in upper jaw. Tongue digitate. Pelvics cup-shaped, not adnate. Gillopinings moderate, 1st slit closed by membrane. Differs from *Pleurosicya* Weber, 1913 in different shape of head and mouth, also characters given in key to genera.

Luposicya lupus n.sp.

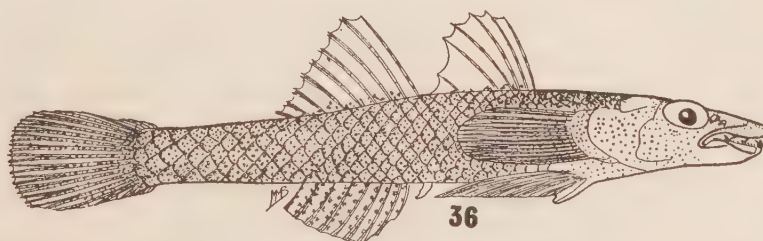


Fig. 36. *Luposicya lupus* n.sp. Type.

D VI+I 8. A I 8. P 14. Scales 32-33. Tr 9-10. Predorsal 9. Depth 6.5, head 3.5, pectoral 5, pelvic 4.2 in body. Eye 3.8 in head, 1.3 in snout. Head depressed, body little compressed, eyes adjacent. No papillae visible. Nostrils tubular, close before eye, hinder larger. Gillopinings to below preopercle, 1st arch closed by membrane, no normal outer rakers. Mouth large, upper lip expanded forwards, spatulate, maxilla to below front of eye. In lower jaw on each side 25 exsert labial teeth, in front a pair of large recurved canines, on side fine teeth curved out and forwards in narrow band. In upper jaw a row of fine teeth, 6-7 outer teeth each side larger, recurved, hinder largest. Palate edentate. Tongue ciliate, pointed. 2nd-4th dorsal spines longest, about body depth, 1st soft ray longest, rays shorter behind, anal similar but lower. Pectoral not to anus, pelvic exceeds pectoral, to anus. fraenum with lobe each side, caudal rounded. Scales ctenoid, few on belly cycloid, whole nape scaly, scales $\frac{2}{3}$ to eye. Chest, pectoral base and head naked. In life translucent, as preserved light, head and body covered with minute brown speckles, a dark patch on occiput. Dorsal, anal, caudal and pectoral spotted. Only the type, 28 mm., Pinda (Moz.).

45. **Pleurosicya** Weber, 1913.

Genotype **P. boldinghi** Weber, 1913. Elongate body with ctenoid scales to nape, head and chest naked. Fine labial teeth in lower jaw, a pair of canines in front. Pelvics form disc, not adnate. Gillopenings unrestricted, rakers present. Eyes adjacent. The type species, from New Guinea, and **annandalei** Hornell & Fowler, 1922 from India, previously known, both species in 7-15 fathoms.

Pleurosicya mossambica n. sp.

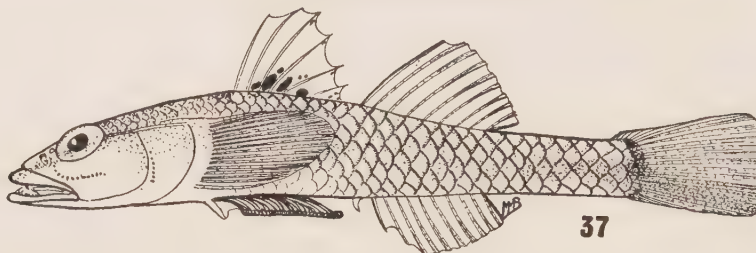


Fig. 37. **Pleurosicya mossambica** n. sp. Type.

D VI+I 8. A I 8(9). P 16-17. Scales 30. Tr 7. 12 predorsal on side of nape. Gillrakers 2+1+5. Depth 5.7, head 3.2, pectoral equals pelvic, 4.6 in body. Caudal 1.4 in head. Eye 3.5 in head, equals snout. Head and body moderately compressed, eyes adjacent. One row of papillae on cheek and one behind preopercle margin. Nostrils close before eye, the anterior a low tube. Gillopenings unrestricted, to below eye, front third of 1st arch closed by membrane, rakers small. Mouth terminal, lips thick, maxilla to below about middle of eye. In upper jaw narrow band of setiform teeth, outer series in front enlarged, recurved. In lower jaw an exert series of fine labial teeth, in front a pair of recurved canines, fine teeth in one row on side. Tongue spatulate. Palate edentate. 2nd and 3rd dorsal spines longest, almost body depth, front soft ray longest, equals body depth, shorter behind, anal similar to but lower than dorsal. Pectoral and pelvic reach near vent, pelvic cup-shaped, fraenum with knoblike fleshy process each side. Caudal subtruncate. Scales ctenoid behind, cycloid on belly and from mid 1st dorsal, smaller in front, mid predorsal naked, with median ridge, sides of nape scaly to eyes. Pectoral base, chest and head naked. In life translucent; preserved, light, few dark specks on pectoral base and head, distinct black marks on base of dorsal. 12 specimens, 17-23 mm. length, Baixo Pinda, the type, 23 mm. The original description of the genotype does not mention nature of gill-opening, but by the kindness of Dr. J. J. Hoedeman of Amsterdam I have examined a paratype of the type species from New Guinea, and it is wide and rakers are present. **mossambica** is closely related to **annandalei** Hornell and Fowler, from India (found commensal with an Alcyonarian), type, 34 mm., **mossambica** differs in having scales 30, Tr 7, instead of scales 26, Tr 9, also **mossambica** has the distinct dark marks along base of dorsal, absent in the Indian form. **P. boldinghi** differs in having D2 and A I 7, and 25 scales. A stained and cleared specimen of **mossambica** shows 12+15 vertebrae, ribs sessile, premaxillary pedicels short, 1+3+1 branchiostegals, 4 pectoral radials, with large central opening between middle pair.

Subfamily GOBIODONTINAE

Compressed oval body, naked or scaly, blunt head, small mouth. Gillopening restricted.

- | | |
|---------------------|-------------------------|
| A. Body scaly | 46. Paragobiodon |
| B. Body naked | 47. Gobiodon |

46. **Paragobiodon** Blkr., 1873.

Genotype **Gobius echinocephalus** Rupp., 1828. Body scaly, head and nape naked, covered with cilia. Mouth almost vertical. Short rounded caudal. One species. PARAGOBIODON ECHINOCEPHALUS (Rupp.), 1828 (PI 12, B). Ruppell 1828, 136, Pl 34, f 3. Also as **Gobius echinocephalus**, has been recorded from earliest times over whole area of W. Indian Ocean north of 24°S. (**amiciensis** Val., 1837; **melanosoma** Blkr., 1852). D VI+I 9-10. A I 8-9. P 20-22. Scales 24-26. Tr 8. Depth about equals head, 3 in body. Eye 3-4 in head, less than interorbital. Maxilla below eye, teeth in bands, a pair of canines at front of lower jaw. Gillrakers obsolete. Dorsals low, anal similar. Pectoral to or beyond anal origin. Pelvic short, fraenum fleshy. Body brown, head pinkish, fins darker. To 40 mm. Over whole W. Indian Ocean, to mid Pacific, in coral.

47. **Gobiodon** Bleeker, 1856.

Genotype **Gobius heterospilus** Bleeker, 1856. Compressed deep, slimy, naked, head and body. Mouth small. Teeth in bands, outer enlarged, 1-4 canines each side in front of lower jaw. Gillopenings only over pectoral base, rakers obsolete. Front nostril tubular. D VI+I 8-12. A I 8-9. P and caudal short, rounded. Pelvics cup-shaped, small. Few small species, Indo-Pacific, in coral. Colour most variable, many nominal species. My extensive material shows extent of gillopening not reliable as a specific feature, and indicates 3, possibly 4, species in our area, easily distinguished.

GOBIODON RIVULATUS (Ruppell), 1828 (PI 10, K, L & N). *Gobius rivulatus* Ruppell 1828, 136. *Gobiodon citrinus* (non Rupp.) Smith 1949, 330, f 905. (*histrio* Val., 1837; *coryphaenula* Val., 1837; *quinquestrigatus* Val., 1837; *erythrophaios* Blkr., 1849; *ceramensis* Blkr., 1852; *erythrospilus* Blkr., 1875; *venustus* Sauvage, 1880). D VI+I 10-11. A I 8-9. P 18-21. 1st D spine shortest. 1-2 large canines each side in front of lower jaw, which shorten with age. Examination of many specimens, fresh and preserved, indicates this as of variable livery; in life most are uniform brown, some brown with narrow blue or pink stripes across the head, sometimes also on body below and behind the pectoral, and some, reticulate, on occiput. An extreme form (juv., PI 10, K) is much as described by Ruppell, translucent emerald green, with blue lines, but with a red line along base of dorsal, and a red artery showing along above vertebral column. All these forms show otherwise apparent identity. Attains 50 mm. Ranges over almost whole tropical W. Pacific and Indian Oceans.

GOBIODON CITRINUS (Ruppell), 1838 (PI 10, M). *Gobius citrinus* Ruppell 1838, 139, Pl 32, f 4. (*hypselerus* Blkr., 1875). D VI+I 10-11. A I 8-9. P 19-21. 1st D spine longest in young, subequal with 2-4 with age. 3-5 small canines, last recurved, each side in front of lower jaw, which projects slightly. Colour variably yellow to dark orange, but lines constant. Attains 50 mm. Known over most of tropical W. Pacific and part of Indian Ocean, now recorded from Delagoa Bay northward, including all islands to Seychelles, in the W. Indian Ocean is much less abundant than *rivulatus* Rupp.

GOBIODON RETICULATUS Playfair, 1866 (PI 13, C). Playfair 1866, 72, Pl 9, f 2 (Aden). *Gobius punctatus* Kossman & Rauber 1877, 19, Pl 11, f 7 (Red Sea). Not seen. D VI+I 10-11. A I 9. P 20. 1st D spines shortest. 1-2 large canines each side of front of lower jaw. In life brownish, fins darker, a dark bordered light blue line along base of D & A. Numerous series of small light or blue spots along body. The type, 1.3", from Aden, also Red Sea. This appears to be a valid species.

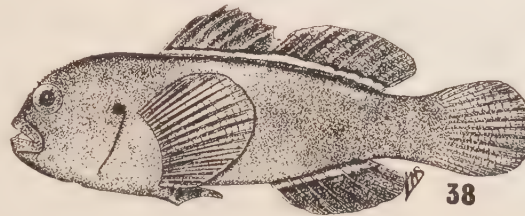


Fig. 38. *Gobiodon albolineatus* n.sp. Type, 30 mm.

Gobiodon albolineatus n.sp.

I have 3 specimens; 12, 19 & 23 mm., La Dique Is., and one, 30 mm., Assumption Is., latter the type. They show D VI+I 10. A I 8-9. P 19-20. Dorsals of equal height. 1-2 canines each side of front of lower jaw, jaws subequal. In life brown, head lighter below, with sharply defined light line along base of dorsal and anal, and small dark spot on opercle. This species is in some ways intermediate between *rivulatus* and *citrinus*.

Family *Periophthalmidae*

Elongate body, with small feebly ctenoid or cycloid scales, head scaly. Snout blunt, eyes stalked. Front nostril in a triangular lobe over lip, hinder a pore near eye. Mouth small, teeth uniserial in lower, in 1-2 series in upper jaw. Gilling opening less than pectoral base. 2 dorsal fins, the 1st of flexible spines, often elevated. Pectoral with muscular base. Pelvic union and fraenum variable. Caudal not symmetrical. 2 genera, both in our area.

- | | |
|--|-------------------------|
| A. One row of teeth in upper jaw | <i>Periophthalmus</i> |
| B. 2 rows of teeth in upper jaw | <i>Periophthalmodon</i> |

Genus *Periophthalmus* Bloch Schneider, 1801.

Genotype *P. papilio* Blch.-Schn., 1801. With the characters of the family, only one series of teeth in upper jaw. The precise diagnosis of species in this almost circumtropical genus is difficult, for it involves either the recognition of a multitude of intergrading forms, or the lumping of most in one highly polymorphous form. Neither alternative is completely satisfactory. Eggert 1935, 29-116, has given a detailed revision of world material, recognising numerous species and sub-species. On this basis W. Indian Ocean specimens fall broadly into 2 of the forms defined by Eggert, and this is provisionally accepted here, with some doubt, as some specimens are intermediate, and it would appear that the dorsal fin changes with age. Both forms, *koelreuteri africanus* Eggert, 1935 and *sobrinus* Eggert, 1935 range from southern Mozambique over East Africa to Seychelles, the former is also found as far south as Umtata River Mouth (Transkei).

- | | |
|---|------------------------------|
| A. D 7-12, 11-12, the 2 fins well separated | <i>koelreuteri africanus</i> |
| B. D 14-17 12, the 2 fins barely separated | <i>sobrinus</i> |

PERIOPHTHALMUS KOELREUTERI AFRICANUS Eggert, 1935 (PI 12, C). Eggert 1935, 78, Pl 5, f 21. *P. koelreuteri* (Pallas), numerous records from W. Indian Ocean. D 7-12 11-12. A 10-11. P 12-13. 1st dorsal lower than body in juveniles, front spines longer with age; 1st dorsal ends well in advance of 2nd in juve-

niles, less with age. Generally dusky, the dorsals with white edge and dark band below. Many specimens, 30-95 mm., from Pondoland northwards to Kenya and Seychelles.

PERIOPHTHALMUS SOBRINUS Eggert, 1935 (Pl 12, E). Eggert 1935, 95, Pl 9, fs 37, 38. **P. cantonensis** (non Osbeck), Smith 1949b, 338, fig. 936. **P. koelreuteri** (non Pallas), numerous records from W. Indian Ocean. D 14-17 12. A 10-11. P 12-13. 1st dorsal longer than high, height increases with age, equals depth of body below, end of 1st fin close to 2nd, edge of 1st fin little concave behind in juveniles, becomes convex with age. Dusky generally, dorsals marked as shown in Plate 12. Many specimens, 75-140 mm., Delagoa Bay, East Africa to Seychelles, the specimen (140 mm.) figured is from Mahé (Sey.).

Genus **Periophthalmodon** Bleeker, 1874.

Genotype **Gobius schlosseri** Pallas, 1770. Almost exactly like **Periophthalmus** Blch.-Schn., except that there is a 2nd row of small teeth behind the outer in the upper jaw. Possibly 2 species, one recorded from our area.

PERIOPHTHALMODON SCHLOSSERI (Pallas), 1770. **Periophthalmus schlosseri** Regan 1908, 254; Hornell & du Pont 1927 (40), 238 (both rec. Seych.). Koumans 1953, 216, f 51. Not seen. D III-X 12-13. A I 11-12. P 16-20. L1 50-60. Tr 14. Predorsal 22-23. 1st dorsal highest in front, not body depth. Small teeth behind outer row. Brown, lightish spots on head and body, a dark bar behind eye. 1st dorsal dark, margin light, 2nd fin dark with darker band along middle of fin. Pelvic and anal yellowish. To 270 mm. Neither record cited above is certainly reliable, possibly confused with **koelreuteri africanus** Eggert, which occurs at Seychelles. We did not find **schlosseri** at Seychelles.

Family Trypauchenidae.

Elongate body, usually scaly. Dorsal and anal long, mostly united with caudal. Pelvics separate or united. A pit at upper margin of opercle, leads to sinus within. Eyes small, below skin. Normally of deep water. 2 genera in our area.

A. No canines	Ctenotrypauchen
B. Canines present	Amblyotrypauchen

Genus **Ctenotrypauchen** Steindachner, 1867.

Genotype **C. chinensis** Stndr., 1867. Compressed body, with cycloid scales, imbricate on tail, head naked. A sharp median crest on occiput. Outer teeth enlarged, no canines. Pelvics united basally, ends free. A single dorsal fin. Widespread in Indo-Pacific.

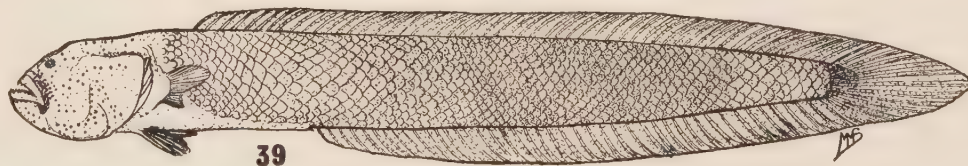


Fig. 39. **Ctenotrypauchen microcephalus** (Blkr.), 130 mm.

CTENOTRYPAUCHEN MICROCEPHALUS (Blkr.), 1860. Smith 1949b, 338, pl 69, f 937 (Caudal should be pointed). (**C. barnardi** Hora, 1926). D VI 48-51. A I 44-47. P 16-17. Scales 60-70, irregular. Tr 13-14. Depth 7-8, head 5.5-6 in body. Pectoral about 3 in head, upper rays longer. Gillopening to below preopercle margin, rakers obsolete. Pelvics united basally, ends free. Pink. 90-155 mm., Natal to Kenya, 2-15 fathoms, mainly muddy bottoms.

Genus **Amblyotrypauchen** Hora, 1924.

Genotype **Amblyopus arctocephalus** Alcock, 1890. Elongate body with cycloid scales, head naked. Eye rudimentary. A sharp median crest on occiput. Canines in each jaw. Dorsal and anal united with caudal. Upper pectoral rays much longer than lower. Pelvics united, deeply emarginate. One species.

AMBLIOTRYPAUCHEN ARCTOCEPHALUS (Alcock), 1890. **Amblyopus arctocephalus** Alcock 1890, 432; and 1892, Pl XX, f 7 (India). Not seen. D VI 40-43. A I 39-41. Scales 50-52. Tr 18. Depth 6.5, head 5 in body. Snout broad, lower jaw projects, a rough knob at chin, a barbel each side of upper lip. Small teeth in bands, in upper jaw on each side 2 canines, in lower on each side 2-4 canines and one median in front. Head naked, body with small cycloid scales. Upper pectoral rays longer. Pelvics small, united. Pink. 130 mm. In 50 fathoms off India, muddy bottom, also recorded from Philippines (1951). Will probably be found in the W. Indian Ocean.

Family Taenioididae

Elongate body, naked or with feeble scales, dorsal and anal long, united with caudal. Pelvics united. No pit in upper part of opercle. Eyes small, below skin.

Genus **Taenioides** Lacepede, 1798.

Elongate body, naked or with feeble scales. Head with numerous tentacles. Eyes reduced, below



PLATE 12.

- | | |
|---|--|
| A. <i>Acentrogobius bontii</i> (Blkr.), 72 mm. | F. <i>Quisquilius inhaca</i> (Smith). Type, 50 mm. |
| B. <i>Paragobiodon echinocephalus</i> (Ruppell). 25 mm. | G. <i>Acentrogobius ornatus</i> (Rupp.). 76 mm. |
| C. <i>Periophthalmus koelreuteri africanus</i> Eggert. 66 mm. | H. <i>Bryaninops ridens</i> n.sp. Type. Pelvics. |
| D. <i>Quisquilius eugenius</i> (J & E). 50 mm. | I. <i>Abranches pinto</i> Smith. Type, 46 mm. |
| E. <i>Periophthalmus sobrinus</i> Eggert. 140 mm. | J. <i>Oxyurichthys lemayi</i> (Smith). Type. Male. 152 mm. |

skin. Mouth almost vertical, obtuse teeth in bands, outer enlarged. Gilloping restricted, rakers mere knobs. Dorsal and anal long, confluent with caudal. Pelvic longer than pectoral.

- A. D 33-34. A 30 **jacksoni**
 B. D VI 43-51. A 43-52 :
 1. Head 1.4 in distance to vent **esquivel**
 2. Head 1.7 in distance to vent **gracilis**
 3. Head 2.2 in distance to vent **cirratus**

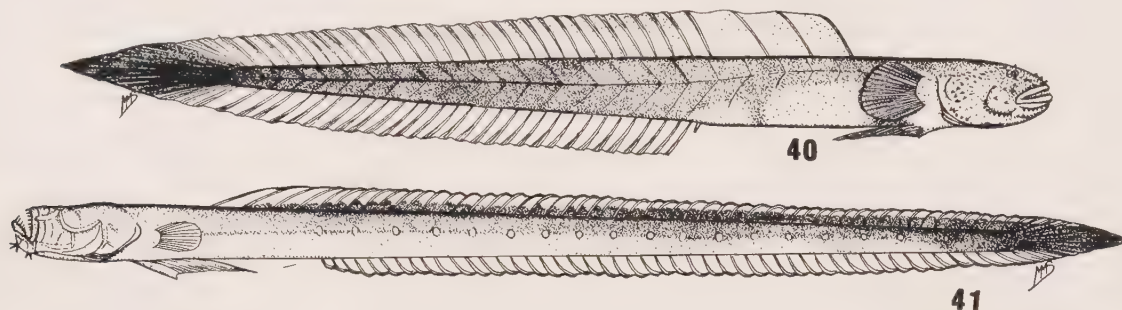


Fig. 40. *Taenioides jacksoni* Smith, 90 mm.

Fig. 41. *Taenioides esquivel* Smith, 292 mm.

TAENIOIDES JACKSONI Smith, 1943. Smith 1943, 70, f 2; and 1949b, 330, Pl 70, f 903. D 33-34. A 30. 7 gillrakers. No scales. Head 3 in distance snout tip to vent, 7 in body. Pectoral 2, pelvic 1.2 in head. 20 teeth in each jaw. Olive brown above. To 90 mm. St. Lucia Estuary, Zululand, in burrows.

TAENIOIDES ESQUIVEL Smith, 1946. Smith 1946, 814; and 1949b, 304, 70, f 904 (Moz.). D VI 48. A 48. No scales. Head 9 in total length, 2.4 in distance from snout tip to vent. Anal origin 2.5 times further from caudal base than snout tip. Pelvic 3 times pectoral, which is 2.8 in head. Greenish above, dorsal and anal pink, caudal dark. Only the type, 292 mm., Delagoa Bay, in mud.

TAENIOIDES GRACILIS (Val.), 1837. Chabanaud 1927, 410, f 5-11 (Mad.). D VI 43-51. A 43-52. 10 outer teeth in each jaw. Head $10\frac{1}{2}$ -11 in total length. Pelvic 3.2 times pectoral, which is 3 in head. To 300 mm. Tropical Indo-Pacific, found at Madagascar.

TAENIOIDES CIRRATUS (Blyth), 1860. **Amblyopus brachygaster** Jatzow & Lenz 1898, 510 (Mad.). **Taenioides caeculus** Chabanaud 1927, 406, fs 1-4 (Mad.). **Taenioides cirratus** Koumans 1953, 270, f 67 (Zanz.). D VI 43-49. A 43-48. 10 outer teeth in upper, 8 in lower jaw. Head 3.2 in distance from snout tip to vent. Pectoral 3, pelvic 1.2 in head. Olive green above. To 300 mm. East Indies, Madag., Zanzibar.

Family Kraemeriidae.

Elongate compressed naked body. Eyes reduced, adjacent, dorsal. Gilloping far forward, rakers small. Mouth moderate, oblique, chin projects, minute teeth in bands, palate edentate, tongue deeply forked. A single dorsal of 5 flexible spiniform rays and 14-15 rays. Anal 13-15, 1st spiniform. V I 5, separate. P 3-8. Possibly 2 genera. Typical sand dwellers.

Genus **Kraemeria** Steindachner, 1906.

Genotype **K. samoensis** Steindachner, 1906. With the family characters. One species in our area.

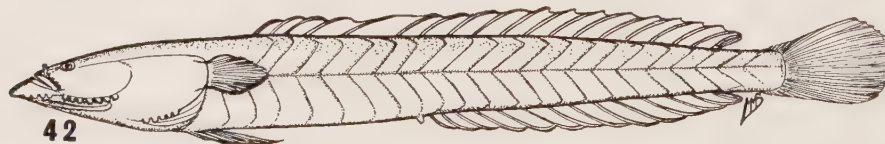


Fig. 42. *Kraemeria samoensis* Sndr., 32 mm.

KRAEMERIA SAMOENSIS Steindachner, 1906. **Psammichthys nudus** Regan 1908, 246, Pl 31, f 1 (Seych.). D IV, I, 14. A I 13. P 2, 5-6, 0-1 = 7-9, normal 8. V I 5. Caudal 2-3, 8-9, 2. 0+9 gillrakers. Depth 8-9, head 3.9-4.2; pectoral (total) 11-12; pelvic 8-9; caudal about 7 in body. Pectoral (total) 2.8-3; pelvic 2.0-2.2; snout (eye to tip of chin) about 3.5 in head. Front nostril a narrow tube over lip. Narrow skinny flap with scalloped edge along above maxilla, one on side of chin to preopercle margin, another along lower opercular margin. Gilloping forward to below preopercle, isthmus narrow, rakers fine points. Mouth oblique, maxilla to below eye, chin very prominent, mouth aperture dorsal, minute teeth in 2-3 series in upper and

1-2 in lower jaw. Tongue deeply forked. Dorsal origin 2-2.2 times further from caudal base than snout tip, the 5th spiniform ray widely separated, last ray double. Anal origin below 7-8th dorsal ray, about midway between caudal base and eye, last ray double. All dorsal and anal rays simple. Pectoral with lobate base, 2 upper rays simple, sometimes lowest also, end of fin reaches below about 2nd dorsal ray. Pelvic bases united, the fins separate, all rays bifurcate, 4th and 5th longest, variably subequal, end of fin beyond pectoral apex, to below 3-4th dorsal ray. Caudal 1.8 in head, rounded, middle 8-9 rays branched. I find constantly D IV, I 14 and A I 13 in all my specimens, but the pectoral rays vary from 7-9. In life translucent; as preserved opaque. Occasional specimens with irregular series of fine black dots on back from occiput to caudal. Numerous specimens, 22-35 mm., Mahé, Silhouette & Denis Is., Seych. We found these mostly where freshwater streams ran dead in beach sand, always facing upstream, at about midtide to high-water mark. Some had been feeding on small Polychaete worms. I can find no valid reason to keep this form distinct from *Vitreola sagitta* Jordan & Seale (Bull.Bur.Fish.1906, XXV, 393, Pl 37, f 1, Samoa), which appears to be generally accepted as identical with *K. samoensis* Stndr., 1906. A stained and cleared specimen shows the skull typically Gobioid, 5 branchiostegals, the 1st and 5th remote, 11+16 vertebrae, ribs sessile, typical splint bone above and below hypurals, caudal with 6-7 procurent spiniform rays above and below, largely concealed.

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INDEX

Names of genera and species of the Western Indian Ocean accepted as valid are in Capitals.

Families and Subfamilies

	Page		Page
Croilinae	186	Kraemeriidae	185, 221
Eleotridae	185	Periophthalmidae	185, 219
Gobiidae	185, 186	Sicydiaphiinae	186, 215
Gobiinae	186	Taenioididae	185, 220
Gobiodontinae	186, 218	Trypauchenidae	185, 220
Gunnellichthidae	185		

Genera

ABRANCHES	188, 206, 211	KRAEMERIA	214, 221
ACENTROGOBIUS	187, 188, 197-203, 208, 214	LUPOSICYA	216, 217
AMBLYGOBIUS	187-8, 204-5	Mahidolia	213
Amblyopus	220, 221	MONISHIA	185, 187, 206-208
AMBLYOTRYPAUCHEN	220	OBLIQUOGOBIUS	187, 191
Aparrius	191, 192	OBTORTIOPHAGUS	187, 188, 193, 194
Apocryptes	203	OLIGOLEPIS	196
BATHYGOBIUS	188, 206, 207, 212	OPLOPOMOPS	186, 189, 190
Bathygobius	206	OPLOPOMUS	187, 188, 189, 215
BIAT	187, 192, 194	Oplopomus	189
Bryanina	216	OXYURICHTHYS	187, 203, 204, 215
BRYANINOPS	215, 216	PALUTRUS	188, 208
CABILLUS	187, 207	PANDAKA	187, 205
Callogobius	194, 211	PARACHAETURICHTHYS	187, 197
Chaeturichthys	197	PARAGOBIODON	218
CHONOPHORUS	187, 191	PERIOPHTHALMODON	219, 220
CORYPHOPTERUS	188, 210, 211	PERIOPHTHALMUS	219, 220
Cotylopus	216	PLATYGOBIUS	187, 191
CROILIA	186	PLEUROSICYA	216, 217, 218
CRYPTOCENTROIDES	188, 213	PLEUROSICYOPS	215, 217
CRYPTOCENTRUS	187, 188, 192-4, 205	Psammichthys	221
Cryptocentrus	213	QUISQUILIUS	188, 208, 210
CTENOGOBIOPS	187, 188, 191	Rhinogobius	201, 215
CTENOGOBIUS	187, 188, 191, 194-7, 201, 214	SEYCHELLEA	187, 204
CTENOTRYPAUCHEN	220	Sicydium	216
DROMBUS	188, 211, 212	SICYOPTERUS	215, 216
FEIA	187, 205, 206	Sicyopterus	202
FLABELLIGOBIUS	187, 205	SILHOUETTEA	188, 213, 214
FUSIGOBIUS	188, 208	SMILOGOBIUS	185, 188
GLADIOGOBIUS	187, 189	STENOGOBIUS	187, 190
GLOSSOGOBIUS	188, 214	STIGMATOGOBIUS	187, 188, 197, 198, 200
GNATHOLEPIS	188, 213	TAENIOIDES	220
Gobiichthys	204	Vaimosa	200
GOBIODON	218, 219	VANDERHORSTIA	187, 192
Gobiosoma	193	Vitreola	222
Gobius	188 on	WAITEA	188, 212, 213
Heteroleotris	210	ZONOGOBIUS	187, 208, 209
IOTOGOBIUS	187, 195		

Species and Subspecies

ACUTIPENNIS	195, 196	AUDAX	198, 201
ACUTIPINNIS	216	aurocingulus	191, 192
acutipinnis	196	BALIURUS	213
AENEOFUSCUS	191	balteata	200
AESTUARIUS	198, 202	BALTEATOPS	198, 200
africana	197	banana	191
AFRICANUS	208, 219, 220	barnardi	220
ALBIMACULATUS	204	BELISSIMUS	198, 202
albolineatus	219	belosso	203
albopunctatus	212	bitelatus	188
amiciensis	218	boldinghi	218
anguillaris	205	BONTII	198, 199
anjerensis	213	brachygaster	221
annandalei	218	brevifilis	197
annulatus	204	bucculentus	191
ANTHIOIDES	210	caeculus	215
ARABICUS	205	CAERULEOPUNCTATUS	193
ARCTOCEPHALUS	220	caeruleus	215
ATHERINOIDES	189-190	calliurus	213
auchenotaenia	197	CANINOIDES	188-9, 215

Species and Subspecies (cont.)

	Page
CANINUS	198, 201
caninus	197
cantonensis	220
capistratus	202
CAUERENSIS	198, 202
ceramensis	219
chinensis	220
chlorostigma	198
CIRRATUS	220, 221
CITRINUS	219
coalitus	212
coeruleus	215
COMETES	191
commersonii	215
CORALLINUS	209
coryphaenula	219
criniger	197
cristatus	203
CROCINEUS	191
CRYPTOCENTRUS	192, 213
cylindricus	197, 201
decaryi	197
DELAGOAE	192
dentatus	213
diacanthus	189
DUBIUS	210
DUQUE	213
ECHINOCEPHALUS	218
elegans	202
ENSIFER	189
erythrophaeos	219
erythrospilus	219
ESQUIVEL	220
EUGENIUS	210
fasciatum	193, 216
FASCIATUS	192-3, 216
fasciatus	195, 204, 213
FASCIARENTIS	193-4
FEROX	198, 200
FILIFER	193
FILOSUS	214-5
FLAMMEUS	209
fontanesii	194
FOURMANOIRI	205
frenatus	215
FUSCUS	207, 212
GENIVITTATUS	190
GIURIS	214
glaucobraenum	210
globiceps	202
GRACILIS	220
grammatogaster	196
grammepomus	191
grandidieri	214
grandinosus	201
GUIBEI	215
GYMNOPOMUS	190
HECTORI	204
hendersoni	202
heterospilus	218
histrio	219
hypselopterus	219
inana	216
inexplicatus	188
INHACA	210
INHACAE	197-8
insignis	213
INSINUANS	213-4
IRRASUS	211
isognathus	215
JACKSONI	220-1
jayakari	215
KENYAE	190
KEY	195
knutteli	193

	Page
KOELREUTERI	219-20
kokius	214
KOSIERENSIS	214
KOUMANSI	194
LACERTOPS	207
LAGOCEPHALUS	216
laticeps	216
LEMAYI	203-4
lesueuri	215
leucomelas	215
lienardi	215
louvali	215
LUPUS	217
luzonica	194
macrophthalmus	208
macrorhynchus	191, 215
macrurus	203
maculipinnis	212
MACULOSUS	213
madagascariensis	215
maindroni	215
MALINDIENSIS	195
maritimus	202
melanobranchus	201
MELANOCEPHALUS	191
melanosoma	218
MICROCEPHALUS	220
MICROLEPIS	203
MINUTA	205
MOSSAMBICA	186, 218
MULTIFASCIATUS	198, 199
myersi	205
MYSTACINA	213
mystacinus	212-3
nebulopunctatus	212
NEBULOSUS	195, 197, 201
NEILLI	198, 200-1
NEOPHYTUS	208
niger	215
nigripinnis	212
NOCTURNUS	195, 196
nuchalis	203
nudus	221
NYMPHA	205-6
obscurus	212
ocellatus	194
OCHETICUS	211
OCTOFASCIATUS	193
OCULATA	206
oculomirus	203
ophthalmonema	203
ophthalmonaenia	202
OPLOPOMUS	188
ORNATISSIMA	192
ORNATUS	198, 202-3
palackyi	211
pallidus	215
papilio	204, 219
PAPUENSIS	203-4, 215
PARVIPINNIS	216
PAVIDUS	195-6
pavoninus	193
personatus	191
petersii	197, 203
PETROPHILUS	212
phalaena	204
PINTO	211
platycephalus	214
pleurostigma	197
PLUMATUS	211-2
POLYNEMA	197
polyzona	190
PRETORIUSI	193
pulcher	188
punctatus	219

Species and Subspecies (cont.)

	Page		Page
punctillatus	212	SOBRINUS	219-20
pusilla	205	soporator	212
pygmaea	205	SORDIDA	206-7
quinqueocellatus	204	SPENCE	198, 203
quinquestrigatus	219	SPHYNX	204
REICHEI	197-8, 201, 214	stagon	204
RETICULARIS	208	STAMINEUS	191
RETICULATUS	219	stimpsoni	216
RIDENS	216	stoliczae	191
RIVULATUS	219	TEKOMAJI	204
rubrotaeniatus	204	TENTACULARIS	203
sadanundio	197	TIMIDUS	217
sagitta	222	TRIANGULARIS	198-9
sambiranoensis	215	ventralis	202
SAMOENSIS	214, 221-2	venustus	219
SCHLOSSERI	220	vergens	189
semicinctus	204	VERSCOLOR	197
SEMIDOLIATUS	208-9	viridipunctatus	198, 215
SEWARDII	194	vonbondei	204
SIGNATUS	198, 202	WILLIAM	206-7
SIMPLEX	198, 200	zanzibarensis	201
SINGAPURENSIS	188		

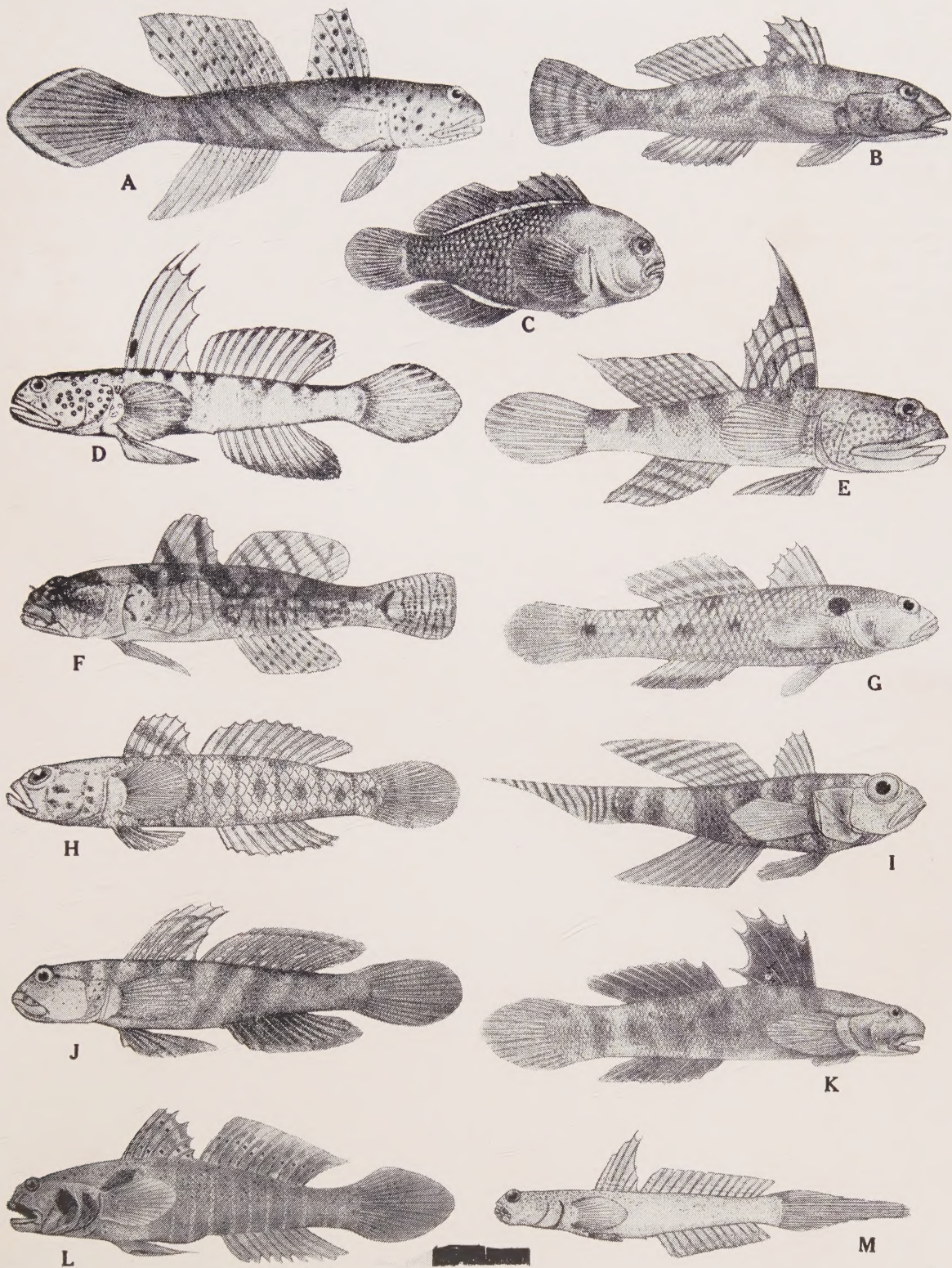


PLATE 13.

- A. *Cryptocentrus caeruleopunctatus* (Rupp.). After Ruppell.
 B. *Chonophorus melanocephalus* (Blkr.). After Day.
 C. *Gobiodon reticulatus* Playfair. After Playfair.
 D. *Cryptocentrus filifer* (Val.). After Jordan & Snyder.
 E. *Waitea duque* (Smith). Type, 77 mm.
 F. *Monishia william* (Smith). 60 mm.
 G. *Acentrogobius caninus* (Val.). After Gunther.

- H. *Coryphopterus ocheticus* (Norman). After Norman.
 I. *Obliquogobius cometes* (Alcock). After Alcock.
 J. *Smilogobius singaporensis* Herre. After Herre.
 K. *Sicyopterus fasciatus* (Day). After Day.
 L. *Cryptocentroides cryptocentrus* (Val.). After Valenciennes.
 M. *Flabelligobius arabicus* (Linn). After Tortonese.

